Duisburg, the busy industrial town at the confluence of the Ruhr and the Rhine. As a river port it handles a greater volume of merchandise than either Rotterdam or Antwerp. *(German Tourist Information Bureau.)*

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Geog

MODERN GEOGRAPHY

BOOK III

EUROPE

BY

D. M. PREECE

LATE SENIOR GEOGRAPHY MISTRESS, CREWE COUNTY GRAMMAR SCHOOL

AND

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MODERN GEOGRAPHY

A course in general and regional geography for schools.

By D. M. PREECE and H. R. B. WOOD, M.A.

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PREFACE TO THE NINTH EDITION

Europe was originally written by the late Miss D. M. Preece, one of the most outstanding teachers of geography in schools, in collaboration with Mr H. R. B. Wood. The second edition was revised by Mr W. Hannah, to whom the authors were particularly indebted for help given at all stages in the preparation of the book, and subsequent editions have been revised by Dr L. J. M. Coleby. *Europe* is the third of a series of six volumes issued under the general title "Modern Geography" and meets the needs of pupils preparing for the General Certificate of Education at the Ordinary Level, and other examinations of similar standard.

The first chapters are devoted to descriptions of the more general features of the geography of the continent as a whole. In the remaining chapters each country is described in turn, due emphasis being laid on the regional aspects. In a book dealing with a continent such as Europe, where international problems and understanding are so closely related to facts of physical, racial and economic geography, it is natural that there should be special reference to such vital problems as those produced by the existence of "minorities" in many of the Danubian states and of the cleavage between East and West. If the teaching of geography is to be of real and lasting value then the pupils of to-day must not only learn the facts of the human geography of Europe, but they must be trained to apply those facts to the problems which they may have to consider as citizens of the future.

The Union of Soviet Socialist Republics has been accorded rather more space than is usual in textbooks of this size. It has been felt that, because of their geographical uniformity, the Russian Lands of Europe and Asia cannot logically be separated. For this reason the U.S.S.R. has been described as a whole in relation to its physical, regional and economic geography. This has been followed by a fuller treatment of the major economic regions of European Russia. The more detailed treatment of Asiatic Russia will be found in the volume on Asia.

As in the case of the preceding volumes, the numerous illustrations and diagrams should prove to be a valuable and attractive feature of the book. Many of the pictures provide suitable subjects for discussion and as the basis of other appropriate exercises.

In the present edition note has been taken of recent changes, particularly in the economic field, and a large number of alterations made throughout the text, with the object of keeping the book as up to date as possible, and of ensuring that the authors' aim of dealing with current problems against their geographical background is constantly brought before the pupil.

Examination questions set at the Ordinary Level of the General Certificate of Education are included by kind permission of the various Examining Bodies concerned. The reviser is indebted to Mr D. C. Money, M.A., F.R.G.S., for permission to reproduce Fig. 99 from his *Introduction to Human Geography*.

Thanks for lending photographs from which some of the illustrations have been prepared are due to the Czechoslovak Embassy; the Danish Embassy; the Greek Embassy; the Royal Netherlands Embassy; the Polish Embassy; the Austrian State Tourist Department; the Belgian State Tourist Office; the French Government Tourist Office; the German Tourist Information Bureau; the Norway Travel Association; the Swedish Travel Bureau; and the Swiss National Tourist Office.

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EUROPE

CHAPTER I

PHYSICAL GEOGRAPHY

The Pre-eminence of Europe

Europe has been called the "most active of the continents" on account of the volume of its trade and industries and the density of its population. Europe occupies one-fifteenth of the land area of the earth, but has one-quarter of the population, *i.e.* nearly four times its share of people relative to the rest of the world. Prior to 1939, Europe exceeded all other continents in the production of 29 products of major importance, which included wheat, oats, rye and barley; sugar, cattle, dairy produce and hides; sheep, wool, flax; coal and iron, and many manufactured goods. Partly as a result of the War, and partly owing to increased production in other continents (particularly Asia and U.S.S.R.), the relative importance of Europe has declined somewhat (see Figs. 1-3) and she is very short of petroleum. Production figures for Europe these days are usually exclusive of the U.S.S.R., which for many years did not publish detailed statistics.

The trade of Europe exceeds that of all other continents, and so does the total output of manufactured goods.

Europeans have explored and colonised a large proportion of the land outside Europe, and to-day Europeans or people of European descent (including Americans) control 50 per cent. of the earth's surface, and the European civilisation is responsible for nearly all the progress of the last few centuries.

The European lead in trade, manufactures, and international affairs may be due to a number of causes:—

(1) Its position in temperate latitudes which are neither too hot nor too cold to hinder progress.

(2) Its central position in relation to the land hemisphere and its position relative to the Atlantic Ocean and America.

(3) The high proportion of habitable land. Europe has little desert, a small proportion of mountain waste, and no areas of impenetrable forest such as the Amazon forest.

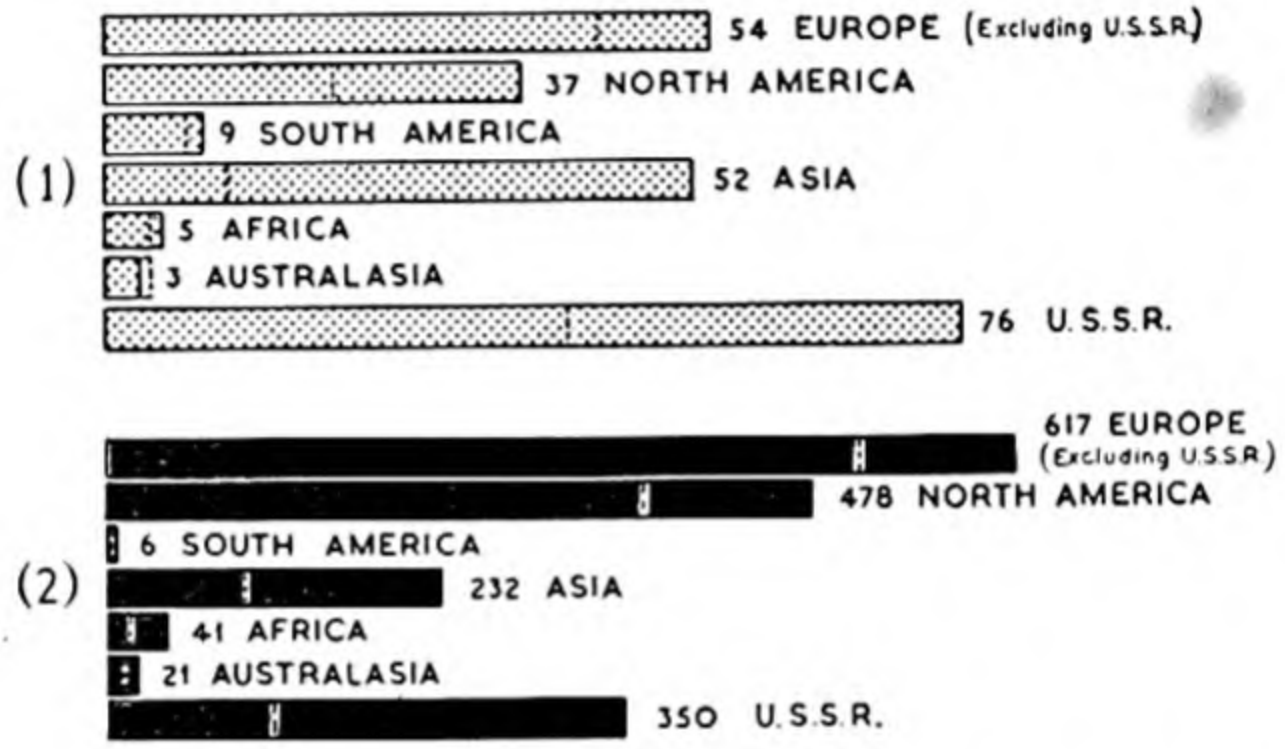


Fig. 1. WHEAT. Fig. 2. COAL. Fig. 3. IRON ORE (Iron content). Production by continents (1958), compared with pre-war (in millions of tons). Note particularly the increases shown by Asia and the U.S.S.R.

(4) The shape of Europe, viz. a large peninsula composed of many smaller peninsulas, so that access to the sea is relatively easy, and moreover, sea influence ameliorates the climatic conditions, especially in the west.

(5) Its large supplies of coal and iron, and their relatively early exploitation.

(6) The mixing of European races resulting in a variety of energetic and inventive people.

The Build of Europe

Structurally, Europe consists of three major divisions with an east to west trend (Fig. 4)—

(1) The Northern Mountains.

(2) The Central Lowlands.

(3) The Southern Mountain Systems comprising: (*a*) the new fold mountains, *i.e.* the Alpine system; (*b*) lower and older and block mountains (the Hercynian system).

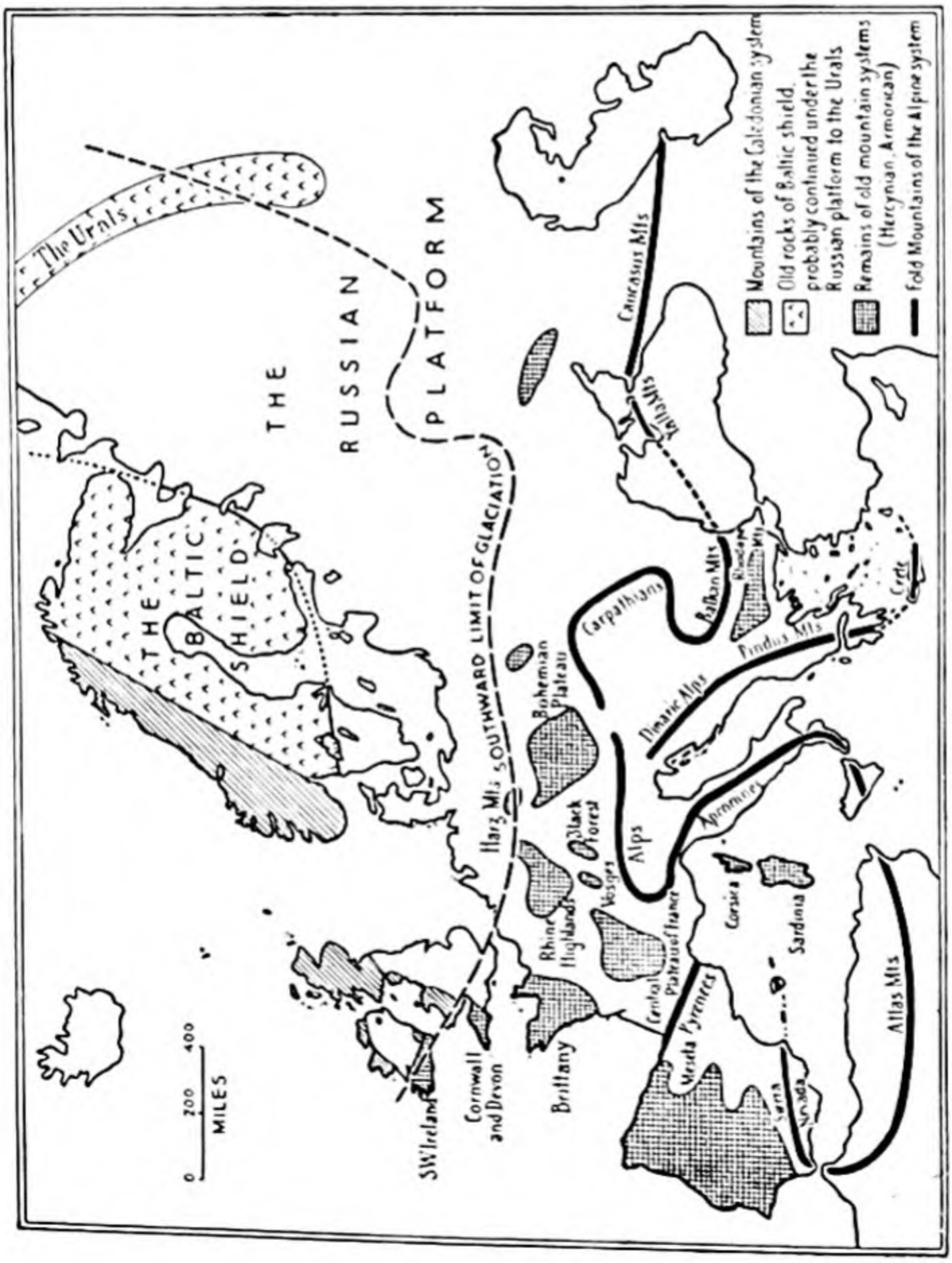


Fig. 4. THE MOUNTAIN SYSTEMS OF EUROPE.

(1) THE NORTHERN MOUNTAINS.—The northern mountain system includes the Urals, the mountains of Scandinavia, Spitzbergen, Iceland, and the mountainous regions of North-Western Britain. It is a region of ancient sedimentary, metamorphic and igneous rocks, which have been lowered by weathering and glacial erosion. The highest points reach 8,000 feet in the Dovre fjeld of Southern Norway. Finland, although not mountainous, is composed of the same ancient rocks, and, structurally, should be included in this region. The southern limit of this area is marked by a line of depressions extending through the Skager Rak, lakes Vener, Vetter, and Malar in Sweden, the Gulf of Finland, lakes Ladoga and Onega in Russia, and the White Sea.

(2) THE CENTRAL LOWLAND.—The Central Lowland of Europe extends from Northern France and South-Eastern England through Holland, Belgium, Denmark, Southern Sweden, North Germany, the Baltic States and Russia. Narrowest in Belgium, it steadily increases in width eastwards. Except in the northern half of Russia, it is everywhere composed of newer sedimentary rocks of Secondary or Tertiary age. These may have been slightly folded and tilted as in Northern France and South-East England, or else, as in North Germany and Russia, they are virtually undisturbed horizontal strata. The general result is a plain of subdued relief and gentle slopes, mostly less than 500 feet above sea-level but rising slowly to just over 1,000 feet in the Valdai Hills of Russia.

(3) THE SOUTHERN MOUNTAIN SYSTEMS.—Structurally this is the most complex division of Europe and consists of two distinct groups of mountains, (*a*) the new fold mountains, and (*b*) the older block mountains.* The relative positions of these two types of mountains are shown in Fig. 4.

(*a*) The new fold or Alpine system (see page 19) consists of high ranges (rising to over 15,000 feet in Mont Blanc) which sweep in great curves from west to east across Southern Europe. The main line extends through the Cantabrian

* The whole system of late Devonian folding is known as the Hercynian System from the Harz Mts. where they are typically exhibited. The western series form the Armorican fragments and the eastern the Variscan fragments (Suess).

Mountains, Pyrenees, Alps, Carpathians, Balkan Mountains and the Caucasus Mountains. From this there are two important branches, (1) through the Apennines, Sicily, the Atlas Mountains of North Africa and the Sierra Nevada of South Spain, and (2) through the mountains of Yugoslavia and Greece, the island of Crete and the Aegean islands to Asia Minor. From earliest times this mountain system has formed a great barrier to intercourse between the Mediterranean and Northern Europe. Hence, where "breaks" (viz. the Rhone valley) do occur they are of great importance as routes (see Fig. 78).

(*b*) The second series of mountains and plateaux in Southern Europe includes the Meseta of Spain, the Central Plateau of France, the Rhine Highlands including the Vosges and Black Forest, the Bohemian plateau, the Rhodope Mountains and the islands of Sardinia and Corsica. These are all much lower than the Alpine mountains and are composed of older rock. They are the fractured remains of an old mountain system (the Hercynian system) which existed in Europe before the Alps were raised. The two series of mountains exerted considerable influence upon each other. Firstly, the sweeping curves of the Alpine ranges were determined by the resistance offered by the older highlands (*e.g.* note the southward bend of the eastern Alps and western Carpathians in relation to the Bohemian plateau). Secondly, the immense pressure of the Alpine folds against the older mountains caused the latter to be fractured. In some cases the fractured areas were uplifted, and in others depressed so that all that now remains of the earlier system are detached plateaux and block mountains, sometimes separated by rift valleys (*e.g.* the Rhine rift valley) (see Fig. 60). Within the curves of the Alpine folds and between the fold mountains and the older block mountains are numbers of lowland areas, *e.g.* the plains of Andalusia and Aragon in Spain, the lower Rhone valley, the plain of North Italy and the Hungarian plain. These were formed by subsidence during the mountain-building period, since when they have been filled with sediments and are now fertile plains. The depression filled by the Mediterranean Sea was probably formed by subsidence during this same period.

The Effects of the Ice Age in Europe

The surface of much of Northern Europe has been greatly modified by glacial action during the Great Ice Age. During that period the climate of Europe was colder than it is to-day. Accumulations of unmelted snow on the highlands of Scandinavia developed into great ice sheets which moved slowly southwards. The southern limit to which the ice spread is marked approximately by a line from the Shannon estuary to London, and thence eastwards across the southern edge of the European Plain to Moscow and north-eastward to the northern end of the Urals (see Fig. 4). Broadly, the action of the ice sheets was twofold, (*a*) erosion in the north and (*b*) deposition of the eroded material further south. In the Northern Highlands of Europe the ice removed the soil and exposed the bare rock over large areas. Mountains lost their ragged outline and became rounded in contour; valleys were deepened and lakes formed both by the scooping out of hollows in the rock (*e.g.* Finland) and by the damming of rivers with morainic debris (*e.g.* in Sweden and Scotland).

Further south in the European lowlands vast areas were covered with glacial deposits which concealed the structure of the land. Such deposits are to be found in various parts of the British Isles (*e.g.* Cheshire, East Anglia and Central Ireland). The fertility of glacial soils largely depends on the nature of the rocks from which they were originally derived. In Northern Germany, bordering the Baltic Sea, are morainic accumulations forming low hills (see Fig. 51). There the soils are extremely infertile as are many of the glacial soils of Central Russia. The uneven and hummocky nature of morainic country hinders natural drainage, and water tends to collect in the hollows. Hence these morainic regions are characterised by numbers of small lakes and marshes, *e.g.* East Prussia. During the maximum extension of the ice, rivers flowing north across the European plain had their outlets blocked. The water accumulated along the southern edge of the ice sheet and lakes of a temporary nature were formed. The Pripet marshes on the Russo-Polish boundary are a remnant of such a lake of the Glacial period. During the Ice Age, too, the glaciers of Switzerland were much more extensive and descended to lower levels than they do to-day.

Some of the lakes of Switzerland and Northern Italy are the result of the damming of river valleys by morainic deposits (*e.g.* Lake Garda).

The Climate of Europe

The characteristic features of the climate of Europe, viz. the absence of large areas of scanty rainfall and the relative equability of all European countries except Russia, are largely due to three factors.

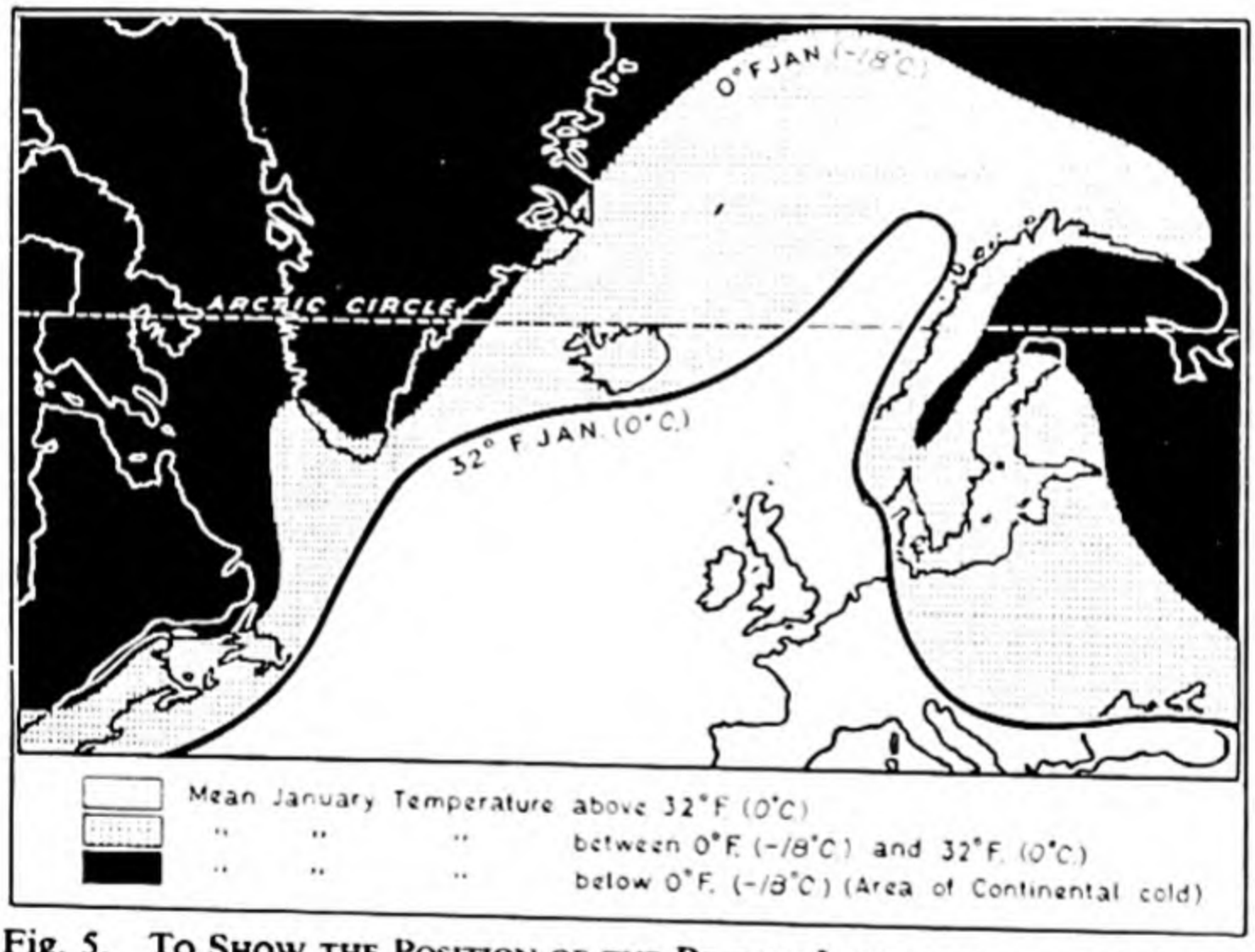

0° F JAN (-18° C)
ARCTIC CIRCLE
32° F JAN. (0° C.)
Mean January Temperature above 32° F. (0° C.)
" " " between 0° F. (-18° C.) and 32° F. (0° C.)
" " " below 0° F. (-18° C.) (Area of Continental cold)

Fig. 5. To Show the Position of the British Isles within the "Gulf of Winter Warmth."

(1) The long eastward extensions of the sea (*a*) along the north to the Gulf of Finland, and (*b*) along the south to the Black Sea. Because of this the influence of the sea is felt in Eastern Europe away from the open Atlantic.

(2) The west to east arrangement of highland and lowland, which allows the penetration of rain-bearing winds from the Atlantic. These winds also help to reduce the range of temperature.

(3) The abnormal warmth of the waters of the North Atlantic. The January isotherm of 32° F. (*0° C.*) makes a great bend north of the British Isles, enclosing the region generally known as the "Gulf of Winter Warmth." The general effect of the warmth of the Atlantic is to raise the winter temperatures of North-Western Europe well above the average for the latitude (see Fig. 5).

Isotherms

The general direction of isotherms in summer in Europe is from west to east, bending slightly northwards in Eastern

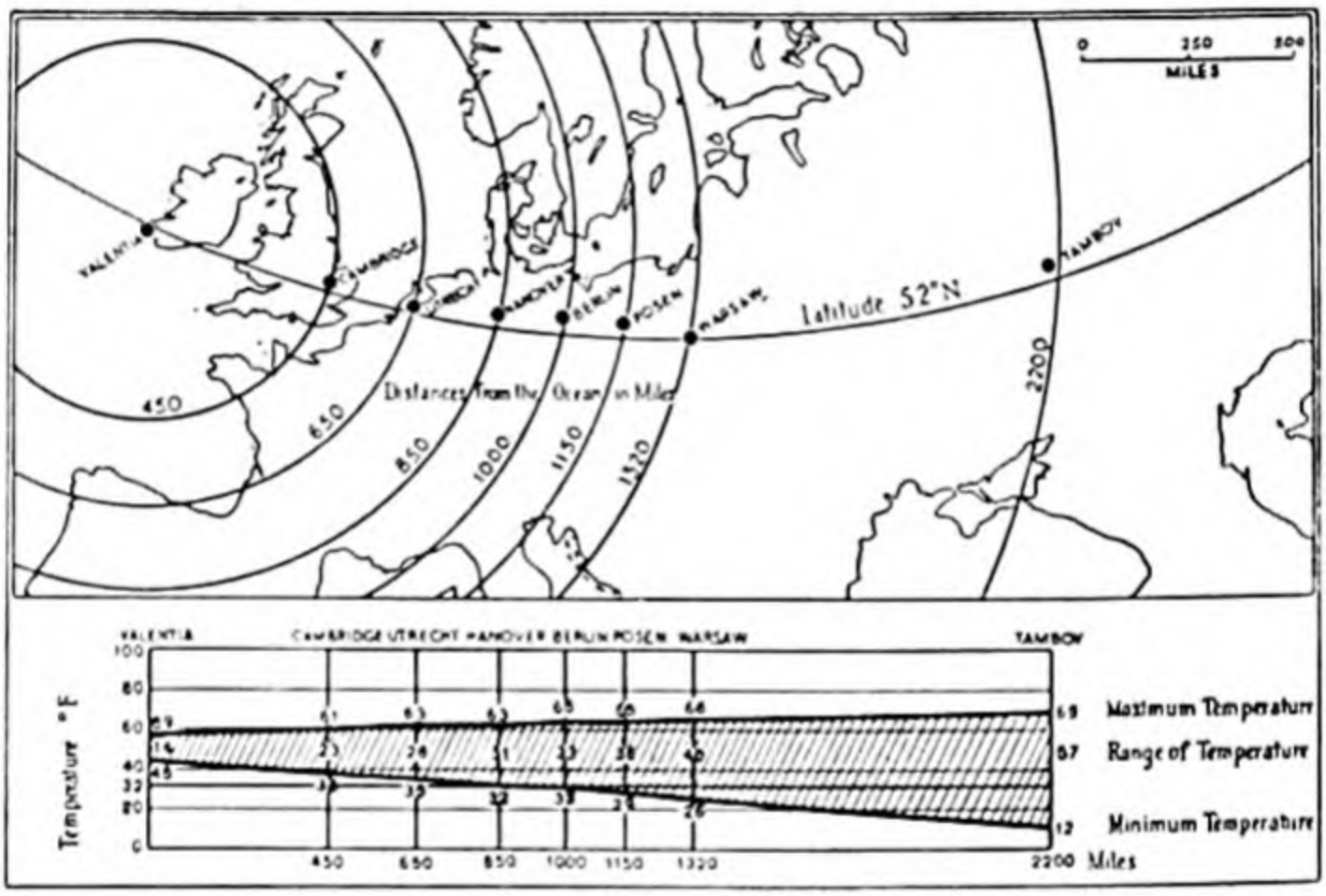


Fig. 6. To Show how Range of Temperature Increases with Distance from Sea.

Europe, and so showing a *gradual* increase in summer temperatures with increasing distance from the sea. The 50° F. (*10° C.*) isotherm passes through Northern Norway and Northern Russia, where it marks the southern margin of the Tundra. The isotherm of 70° F. (*21° C.*) runs west to east through the heart of Central Europe, so that all Southern Europe has average summer temperatures above 70° F. (*21° C.*). The central areas of the three southern peninsulas (viz. Spain, Southern Italy and Greece) have average summer temperatures exceeding 80° F. (*27° C.*).

The January isotherms of Europe offer a striking contrast to those for July, in that over the whole of peninsular Europe they tend to run north and south. This is due to two factors—the continental cold to the east, and the abnormal ocean warmth to the west. The course of the 32° F. (*0° C.*) should be carefully noted. It shows that Cornwall, in January, is as warm as the south coast of France, and that Iceland is as warm as the northern shores of the Black Sea, in spite of the fact that Iceland is about 1,500 miles farther north than the Black Sea. In winter temperatures decrease rapidly eastwards, and thus range of temperature increases eastwards (see table below and Fig. 6).

	Distance from open Atlantic in miles	Temperature for hottest month	Temperature for coldest month	Range
Valentia	0	59° F. (*15° C.*)	45° F. (*7° C.*)	14 F.° (*9 C.°*)
Cambridge	450	61° F. (*16° C.*)	38° F. (*3° C.*)	23 F.° (*13 C.°*)
Utrecht	630	63° F. (*17° C.*)	35° F. (*2° C.*)	28 F.° (*16 C.°*)
Hanover	850	63° F. (*17° C.*)	32° F. (*0° C.*)	31 F.° (*17 C.°*)
Berlin	1,100	65° F. (*18° C.*)	32° F. (*0° C.*)	33 F.° (*18 C.°*)
Posen	1,350	65° F. (*18° C.*)	29° F. (*−2° C.*)	36 F.° (*20 C.°*)
Warsaw	1,480	66° F. (*19° C.*)	26° F. (*−3° C.*)	40 F.° (*22 C.°*)
Tambov	2,100	69° F. (*21° C.*)	12° F. (*−11° C.*)	57 F.° (*32 C.°*)

It should be noted that the summer temperatures increase more slowly eastwards than the winter temperatures decrease, showing that the sea has a greater moderating effect in winter than in summer.

If the January isotherm of 32° F. (*0° C.*) and the July isotherm of 70° F. (*21° C.*) are drawn on the same map, four distinct temperature regions result which are shown in Fig. 7. They are (*a*) the north-west, with very low ranges of temperature, mild winters and cool summers, (*b*) the south-west, with mild winters and hot summers, (*c*) the north-east, with cold winters and cool summers, and (*d*) the south-eastern region with the greatest ranges of temperature, cold winters and hot summers.

Rainfall

In general, the rainfall of Europe decreases from the north-west, where the mountainous areas of Britain have nearly 200 inches of rain per annum, to the south-east where the regions between the Black and the Caspian Seas have less than 10 inches annually. The only other region of low rainfall in Europe is in the north of Russia, in the cold lands of the tundra, where the annual precipitation is also less than 10 inches. The distribution of rainfall is determined by several

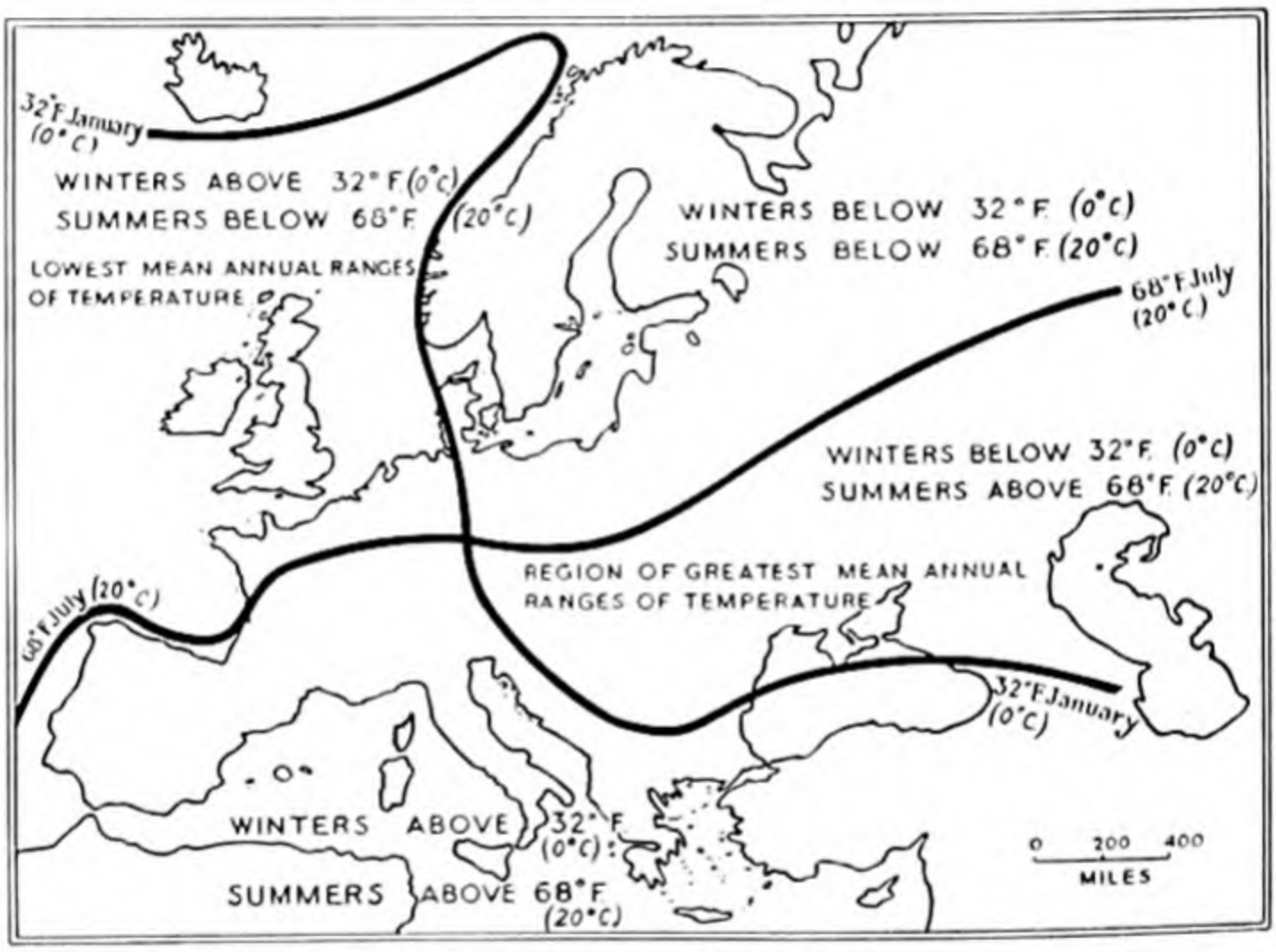


Fig. 7. EUROPE—TEMPERATURE.

factors, (1) the winds, (2) the seasonal changes of pressure on the continent of Europe, and (3) the relief.

In *winter* the whole of Europe lies in the track of the westerly winds and their attendant depressions. The heart of the continent is, however, a region of high pressure due to intense cold (Fig. 8). This wedge of high pressure divides the depressions from the Atlantic into two streams, (1) one of which travels north of the high pressure zone along the coast of Norway, and (2) the other south of the high pressure zone along the Mediterranean. Thus rain falls over the whole of

the north-west margins of the continent and in Mediterranean countries, but the interior of Europe, except on mountain ranges, has little rainfall.

In *summer*, owing to the migration of the world pressure belts, the north of Europe is under the influence of the westerlies, and the Mediterranean area is a region of relatively high pressure and of north-easterly winds. The east of Europe is, however, a region of low pressure to which the depressions

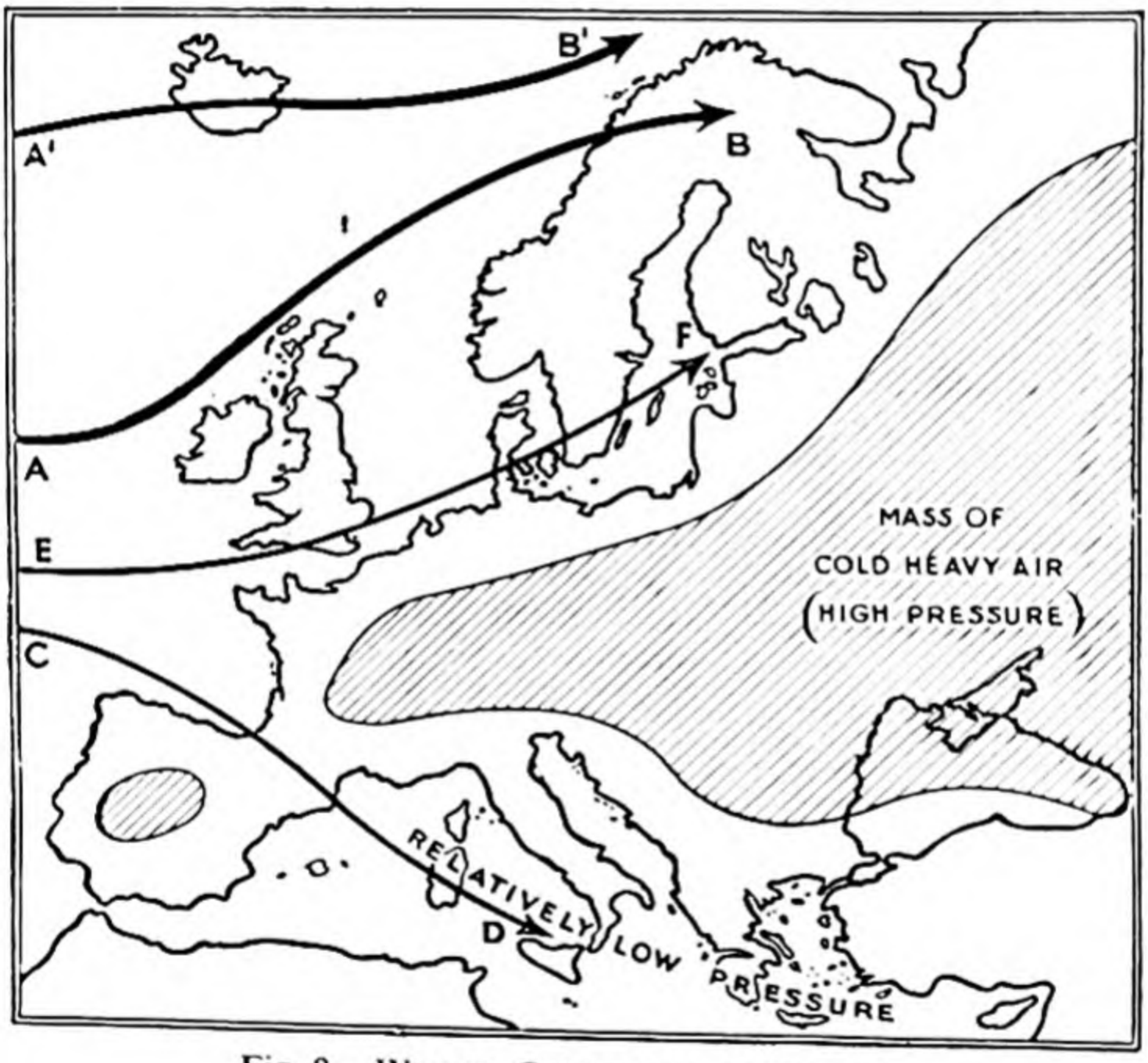


Fig. 8. WINTER CONDITIONS IN EUROPE.

of the Atlantic are attracted (Fig. 9). The Mediterranean lands receiving no Atlantic winds have a very low summer rainfall in the north, and are almost completely dry on the southern margins. The north-western coastal areas of Europe again have rainfall brought by the depressions. The interior of Europe, instead of being dry as in winter, has a moderate rainfall, partly due to the passage of depressions

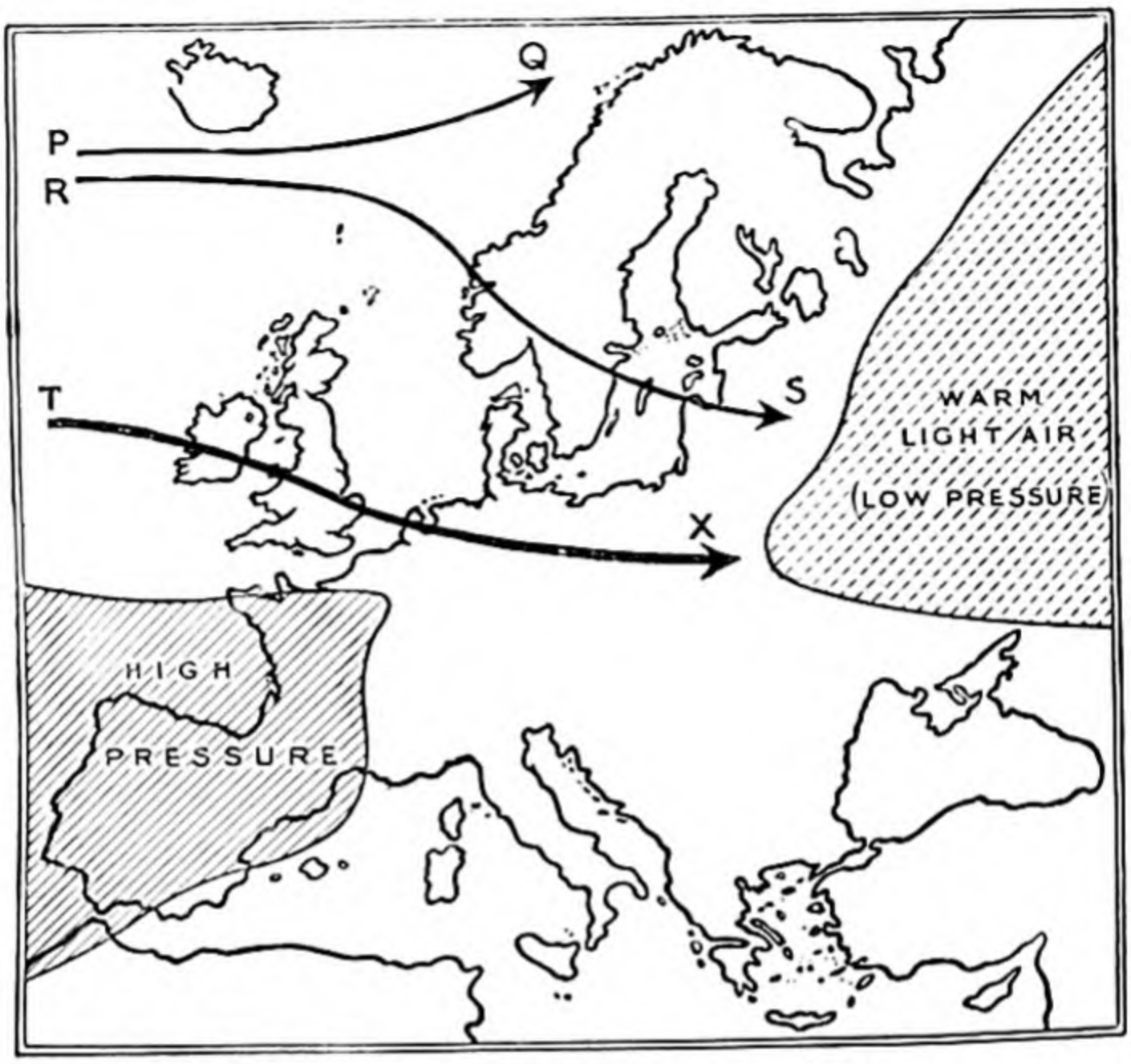


Fig. 9. SUMMER CONDITIONS IN EUROPE.

from the Atlantic and partly due to convection. The summer rainfall decreases steadily eastwards towards the Caspian Sea.

Thus in Europe there are five rainfall zones (Fig. 10)—

(1) The north-western regions, which have heavy rain falling throughout the year, but with a maximum in autumn and winter.

(2) The Mediterranean area, with moderate winter rain and light or scanty summer rain.

(3) The interior of Europe, with moderate to light summer rainfall, but with heavier rainfall in mountainous regions.

(4) The tundra, with scanty rainfall and a summer maximum.

(5) The regions near the Caspian Sea, with scanty rainfall.

The Vegetation of Europe

Little of the original vegetation of Europe remains to-day, for during the long centuries of development and settlement man has cut down the forests and cultivated the land. The greater part of the continent was originally covered by cool temperate forests, both deciduous and coniferous.

Except where highland areas break the continuity, Europe can be divided into six vegetation zones (Fig. 11).

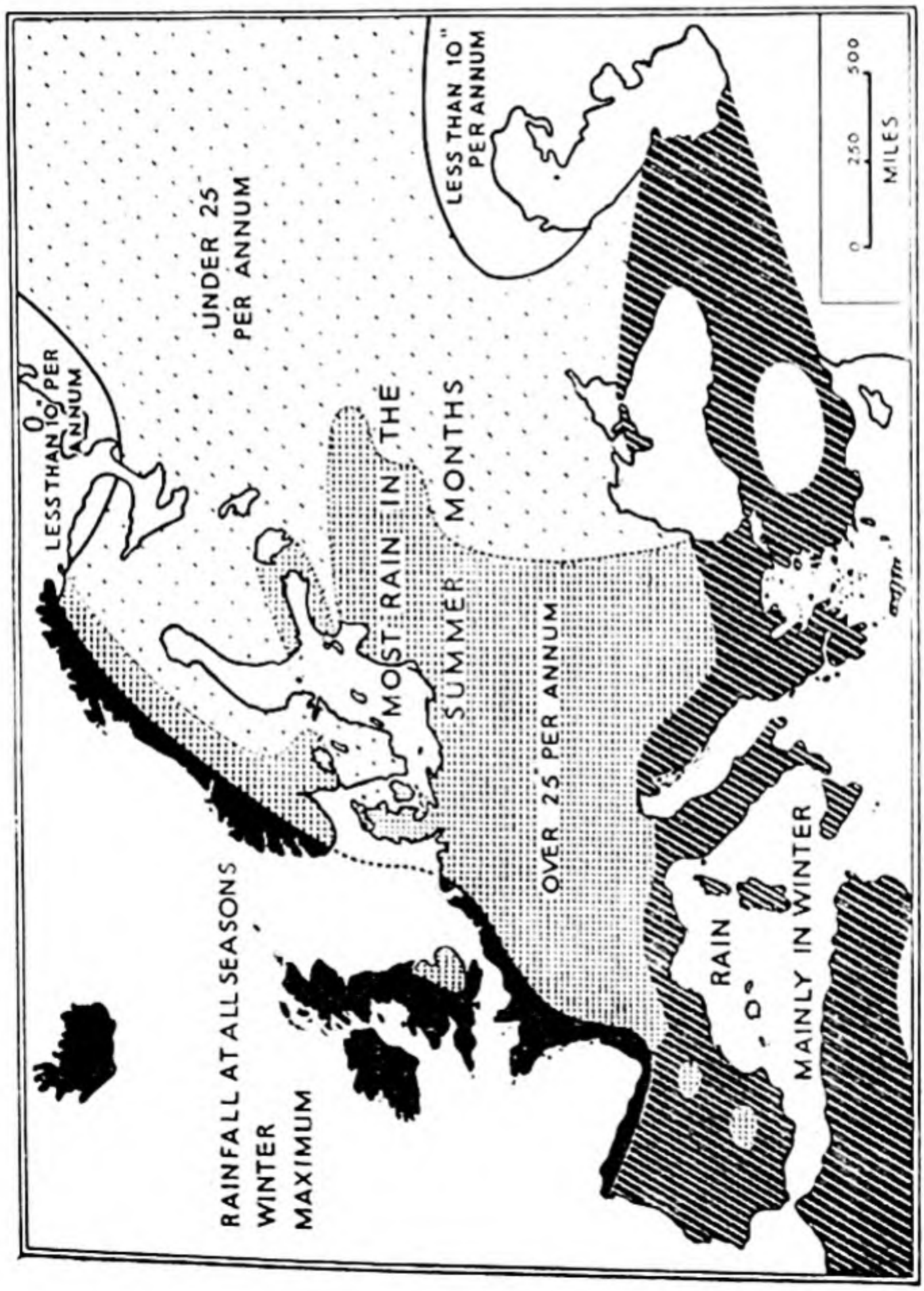


Fig. 10. Generalised Rainfall Map of Europe.

(1) In the north of Russia is a narrow strip of tundra (cold, almost treeless plains), where the principal vegetation is mosses, lichens, berry-bearing bushes, and occasional stunted birch trees.

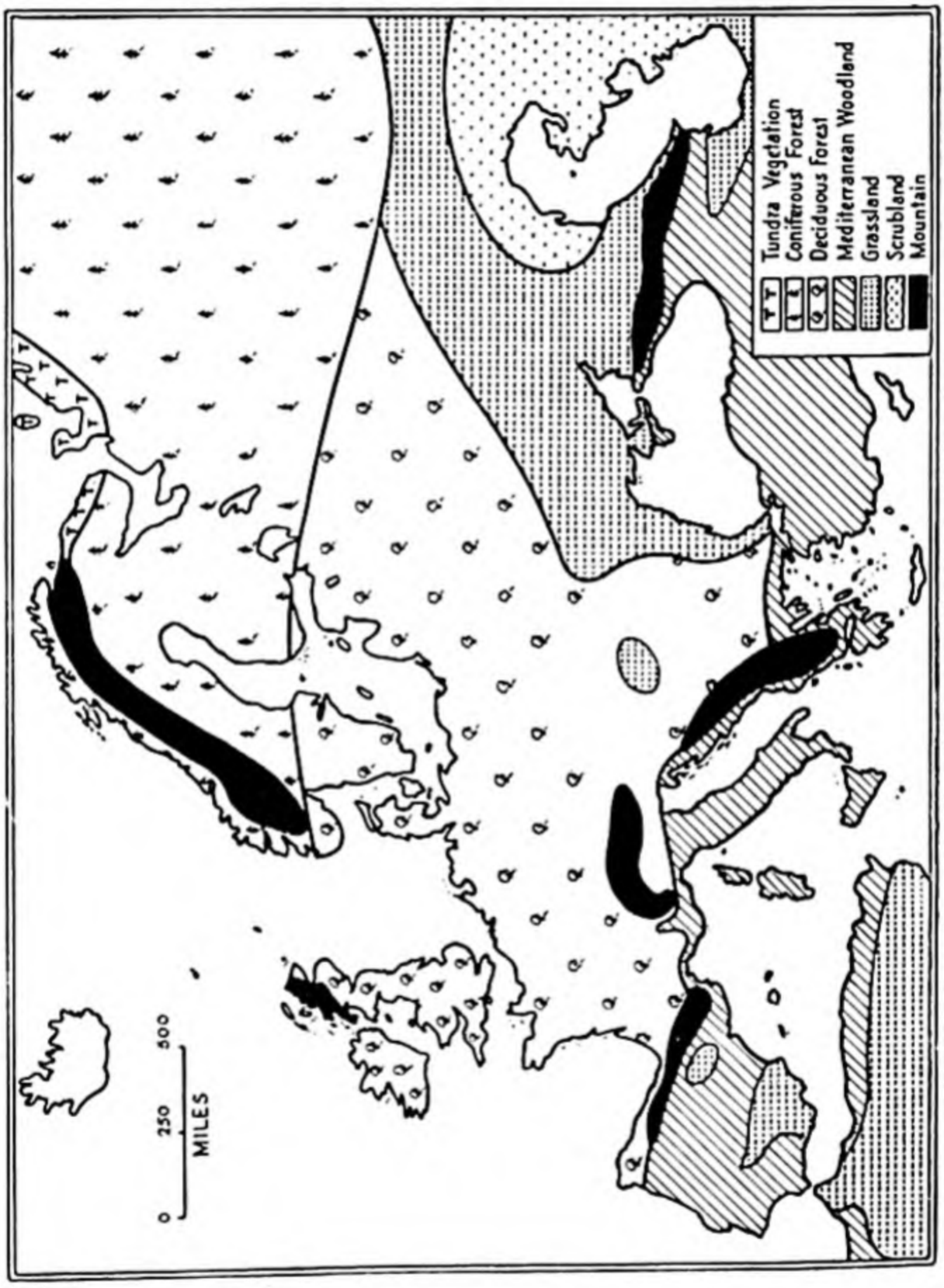


Fig. 11. A Simplified Vegetation Map of Europe.—Note that vegetation changes with altitude, *e.g.* in the deciduous forest zone, the highlands are often covered with coniferous forest, and the highest areas may be devoid of trees. Much of the original forest has been cleared.

(2) South of the Tundra is a broad belt of Coniferous Forest, extending through Scandinavia and Russia roughly north of a line from Oslo through Leningrad to the southern end of the Urals. Near Ufa a large area of this forest

is still uncleared and is an important source of timber, wood-pulp, etc. The chief trees of this belt are pine, fir, spruce, larch, etc.

(3) South and west of the Coniferous Forest belt is the deciduous forest belt, lying between the Oslo-Ufa line and a line from North Spain to Ufa. Most of this forest belt has been cleared, but it was originally a wedge-shaped area narrowing eastwards along 55° north to the southern end of the Urals, where it ended. Within this area conifers replace

Fig. 12. THE NATURAL REGIONS OF EUROPE.

deciduous trees on highland areas (*e.g.* the Black Forest), and on porous or sandy soils (*e.g.* the Luneberg Heath in Germany or the forests of Fontainebleau near Paris). Since the conifers grow in the least productive areas there are still large uncleared tracts, especially on mountain slopes. The principal trees of the deciduous type are oak, ash, elm, poplar, alder, willow, beech, etc.

(4) In the Mediterranean lands the natural vegetation is of the broad-leaved evergreen type, including the laurel, myrtle, olive, etc., with conifers, such as cedars and cypresses.

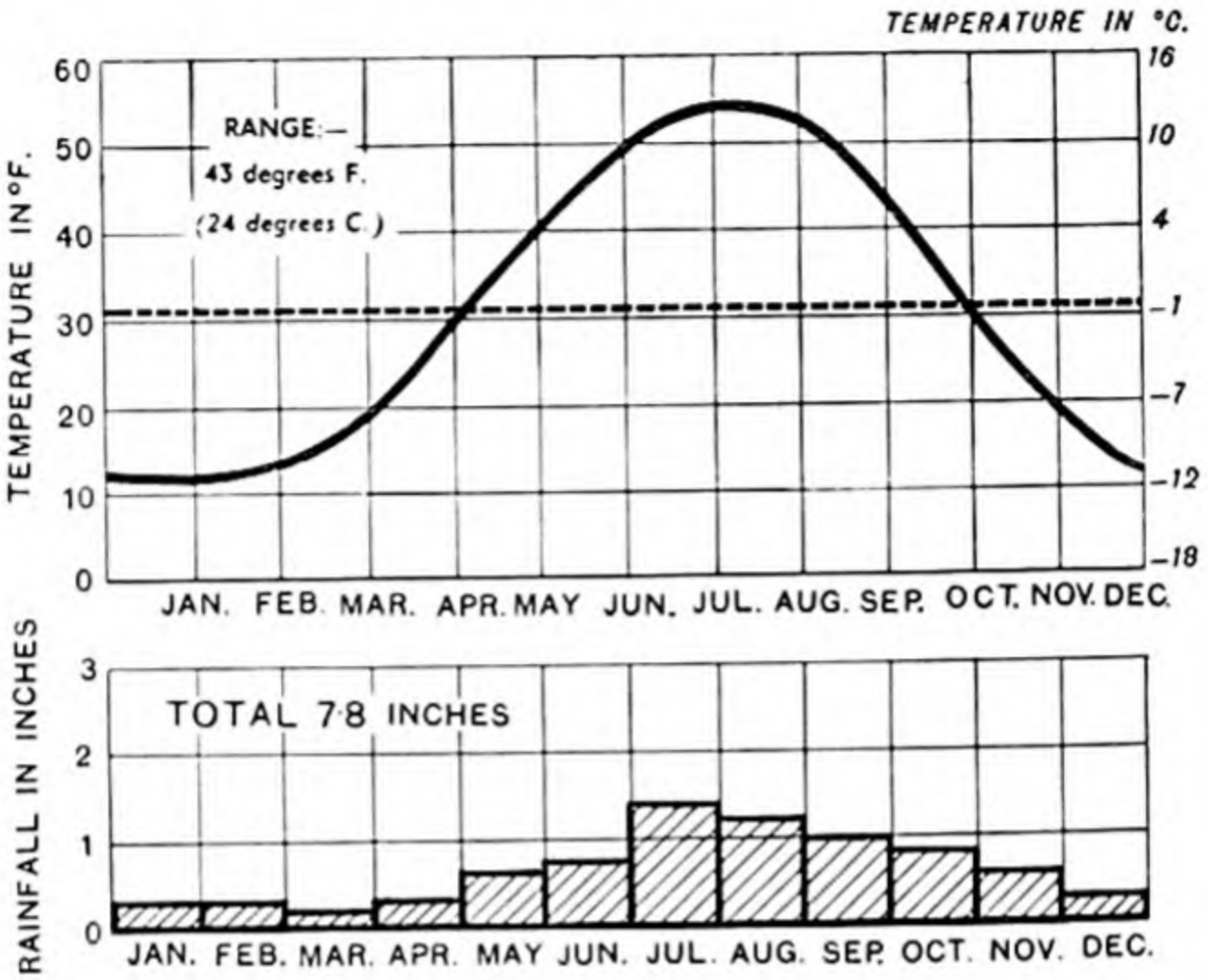


Fig. 13. TUNDRA TYPE. KOLA.

(5) South of the deciduous forest belt in Russia is a vast grassland area extending southwards to the shores of the Black Sea. This is the steppe land, and a small area similar in type is found in the Hungarian plains.

(6) East of the River Volga the steppe lands become drier and gradually merge into semi-deserts of the Caspian depression.

The Natural Regions of Europe

Europe can be divided into a number of major natural regions based on considerations of relief, climate and vegetation. The extent of the natural regions of Europe is shown in Fig. 12.

THE TUNDRA (Fig. 13).—Broadly speaking, the southern limit of the tundra is the July isotherm of 50° F. (*10° C.*), the northward limit of tree-growth. The summers are short and cool [below 50° F (*10° C.*)], and the winters long and cold [below 32° F. (*0° C.*) and often below 0° F. (*−18° C.*)]. The summer days are long, and the period of continuous daylight increases northwards from the Arctic Circle. The winter days

are short, with periods of continuous darkness at midwinter. The rainfall is scanty, usually less than 10 inches annually. Most of the precipitation falls in the summer. In winter the snow accumulates, and tends to give an erroneous impression of the amount of winter precipitation. The tundra is covered for the most part with mosses and lichens, but on sunny south-facing slopes there is a wealth of brightly-coloured flowers, saxifrages, polyanthus, etc., in summer. In other localities are

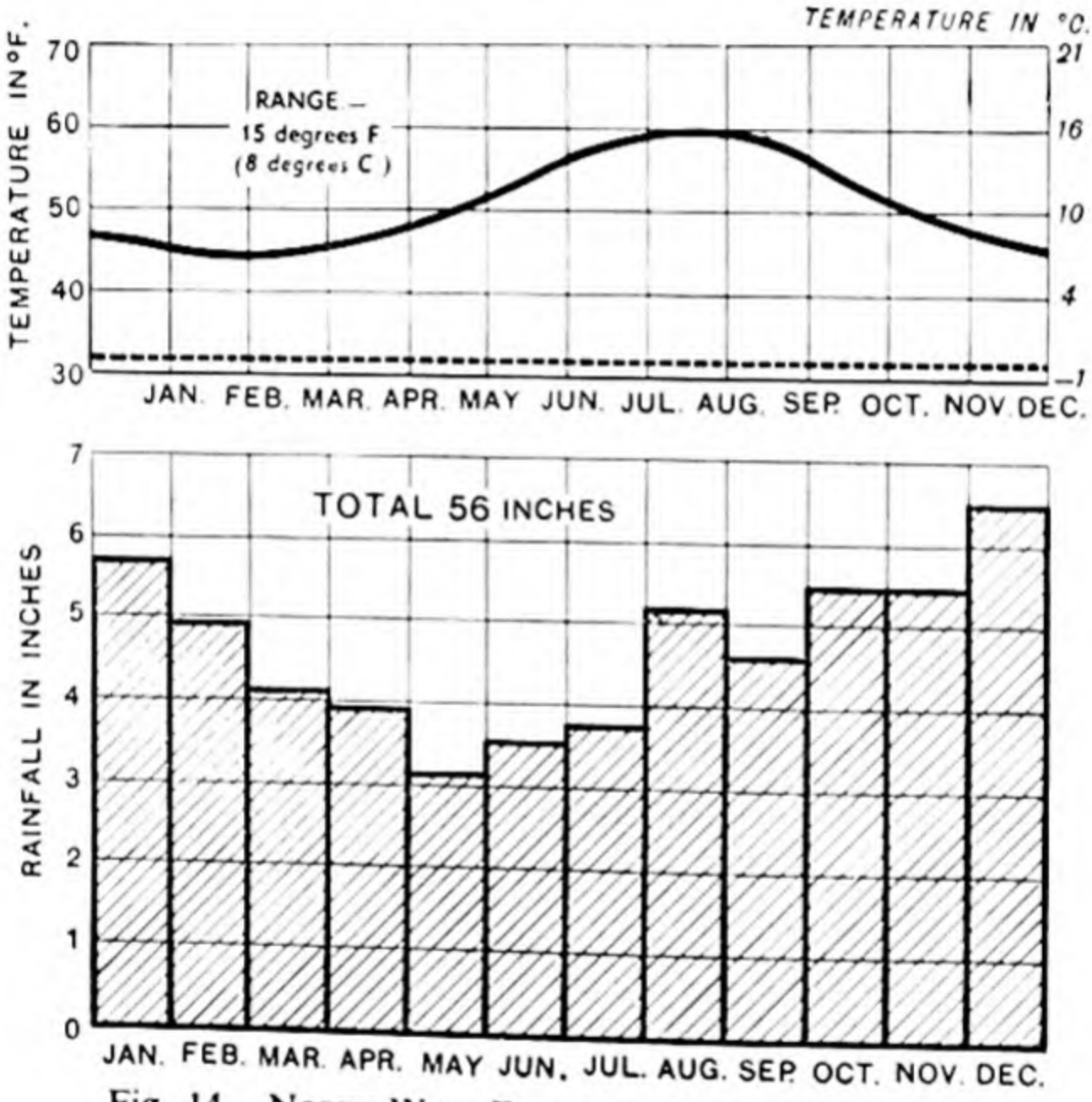


Fig. 14. NORTH-WEST EUROPEAN TYPE. VALENTIA.

short berry-bearing bushes (*e.g.* bilberries, whortleberries), while along the course of the rivers there are often stunted birch trees. In these regions agriculture is impossible because of the shortness and coolness of the summers, and because the ground is frozen for more than half the year.

THE COOL TEMPERATE WESTERN MARGIN TYPE (Fig. 14).—This includes the west of Norway, Denmark, Holland, Belgium, North-West France, North Spain, the British Isles and Iceland.

The outstanding features of the climate of this region are the excessive warmth of the winters compared with the average for the latitude, the small range of temperature, the humidity and the cloudiness. Average winter temperatures do not fall below 32° F. (*0° C.*), and average summer temperatures are everywhere below 70° F. (*21° C.*). Rain falls at all seasons, but the maximum precipitation is in autumn and winter. The

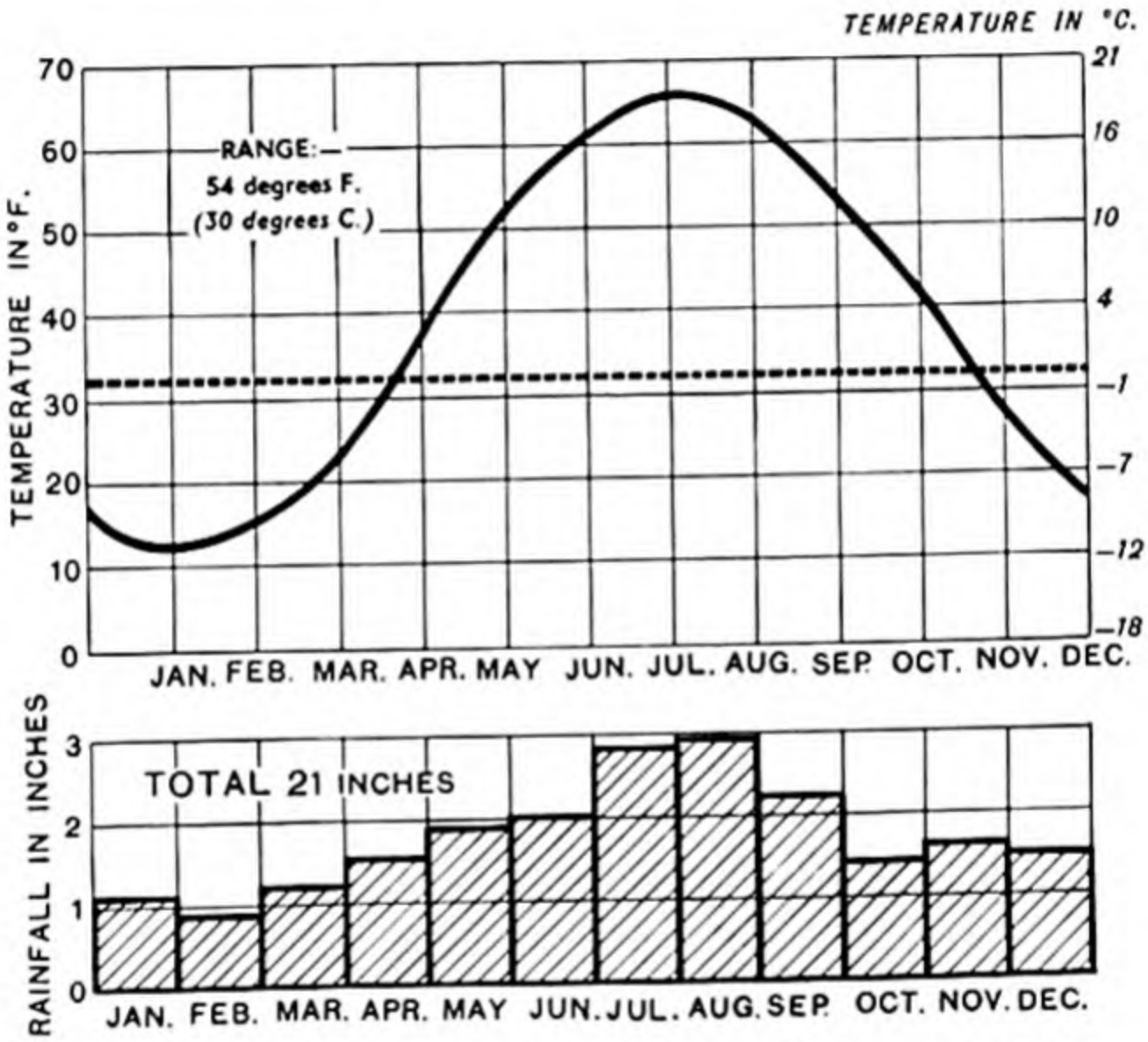


Fig. 15. RUSSIAN CONTINENTAL (SIBERIAN) TYPE. MOSCOW.

amount of rainfall varies from 200 inches in mountainous districts (*e.g.* Snowdonia) to 20 inches (*e.g.* at the mouth of the River Thames) in sheltered plains.

The natural vegetation has, for the most part, been cleared for agriculture, but originally these lands were covered with forests of deciduous trees, *e.g.* elm, poplar, oak, ash, beech. Conifers replace deciduous trees on the cooler highlands and in regions of light sandy soils, *e.g.* the forests of Fontainebleau near Paris.

THE COOL TEMPERATE CENTRAL AREAS OR SIBERIAN TYPE.—In Europe this region, because of its extent, can be conveniently subdivided into—

(1) The truly continental area of Russia (Siberian Type).

(2) The lands bordering the Baltic Sea (Baltic Type).

(3) The lands of Central Europe north of the Mediterranean (Central European Type).

(1) The continental area of Russia (lying roughly north of the latitude of Kiev) is a region of hot summers and very cold

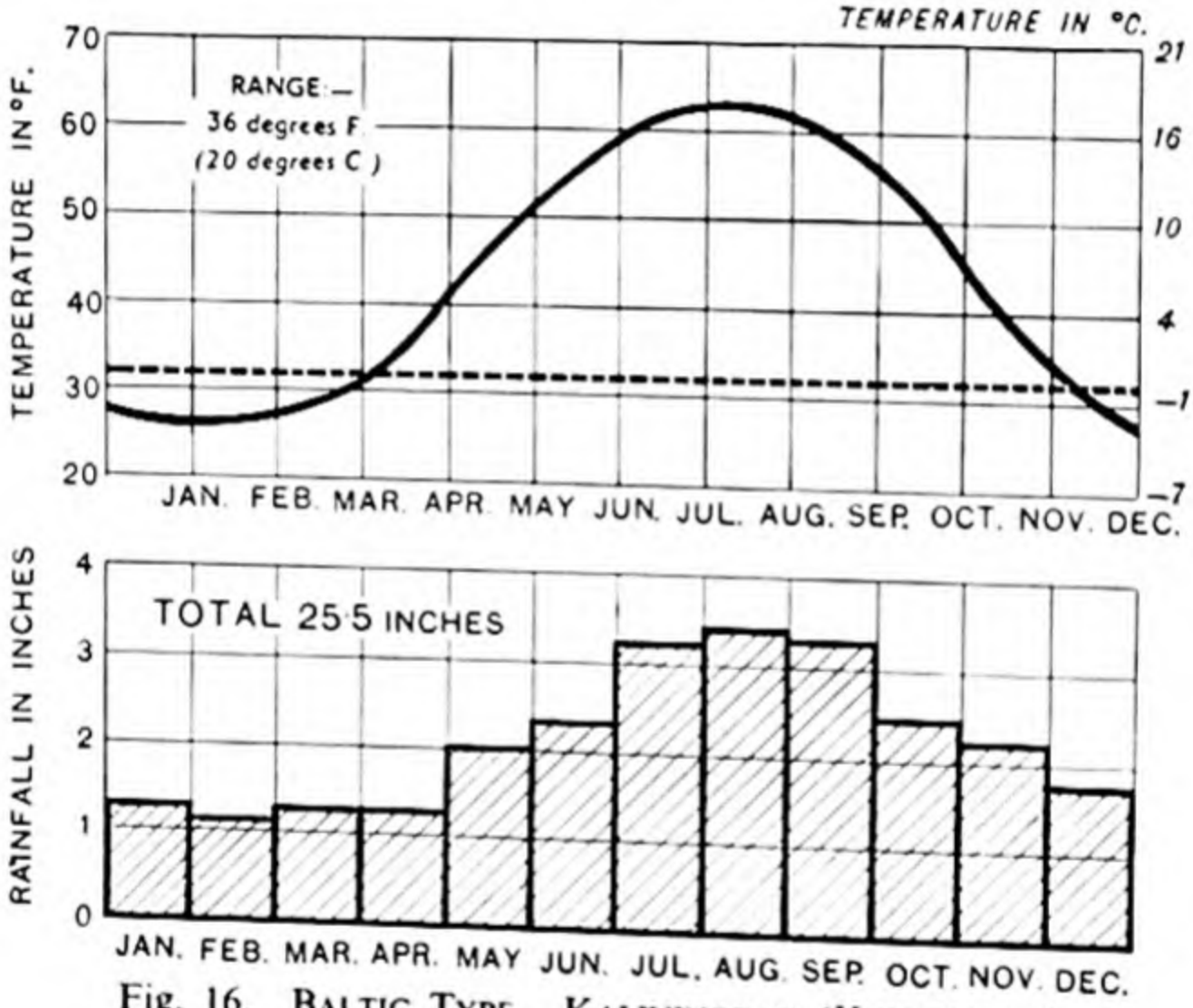


Fig. 16. BALTIC TYPE. KALININGRAD (KONIGSBERG).

winters [20° F. to 0° F. (− 7° C. to −18° C.)] (Fig. 15). The rainfall is light, averaging about 20 inches annually, and it falls mainly in the summer.

The vegetation consists of unbroken stretches of coniferous forest in the north, but further south the original deciduous forests have largely been cleared for agriculture.

(2) The Baltic Region is really a region of transition between the western marginal lands and the continental areas (Fig. 16). It is neither so wet nor so equable as the western margin, because it lies further from the open Atlantic. But, on

the other hand, because of the inland penetration of the North and Baltic Seas, it has more rain and less extreme temperatures than the heart of Russia. Again, whereas western Europe has a winter maximum of rainfall, and the Russian plains have summer rain, the Baltic lands have rainfall fairly evenly distributed throughout the year, but often with a summer maximum.

(3) The Central European region is very similar to the Baltic region, except that the summer temperatures are higher (Fig. 17).

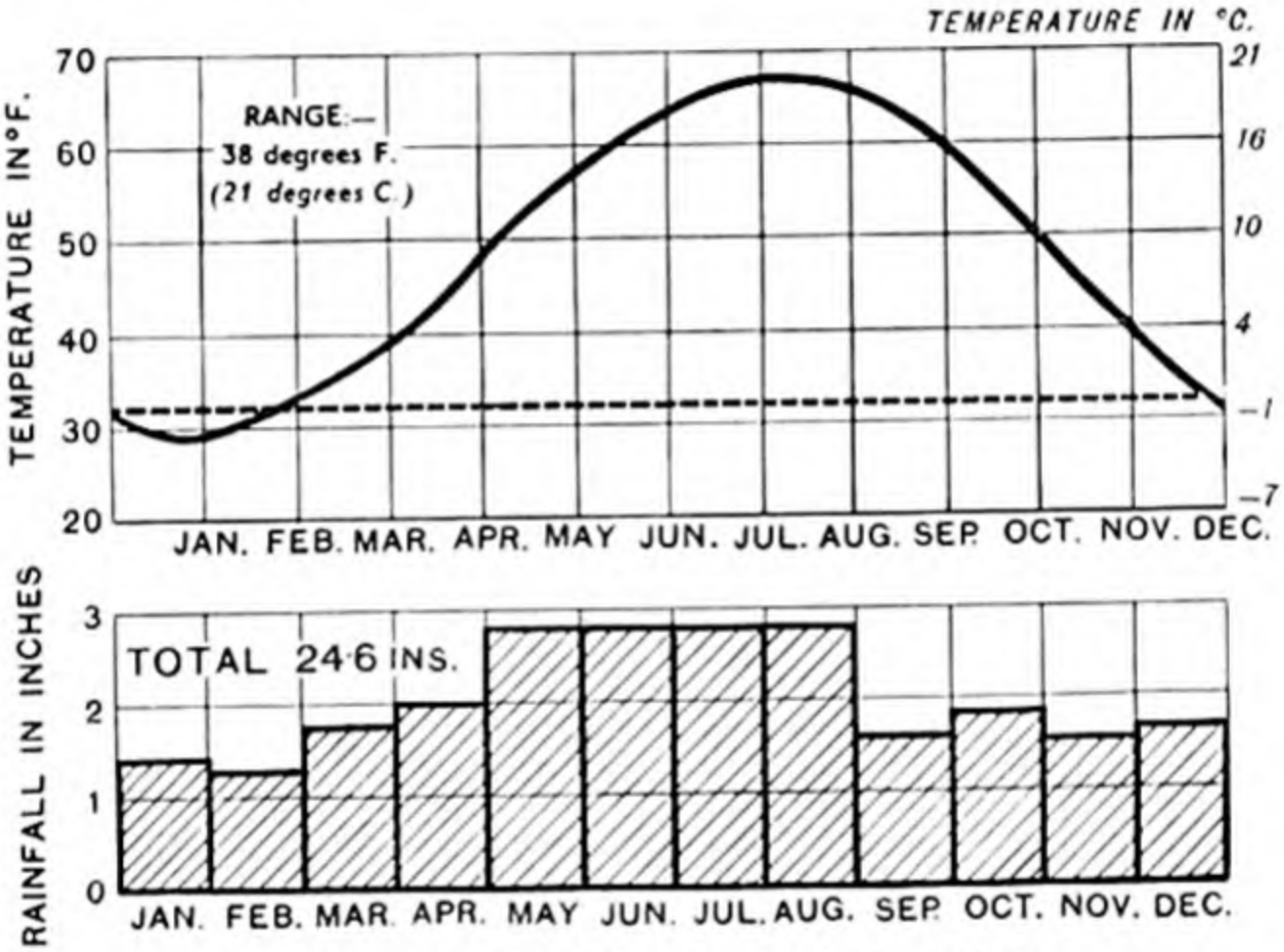


Fig. 17. CENTRAL EUROPEAN TYPE. VIENNA.

THE WARM TEMPERATE WESTERN MARGIN OR MEDITERRANEAN TYPE.—The Mediterranean region includes all the lands bordering the Mediterranean Sea, with the exception of Central Spain, the Po Basin, and the interior of Greece and Yugoslavia. The climates of these three regions are not characteristically Mediterranean in type, and will be discussed separately.

The Mediterranean region has hot summers [over 70° F. (*21° C.*) and over 80° F. (*27°C.*) away from the sea as in Southern Italy]. The winters are warm, averaging about 50° F. (*10° C.*). Rainfall is mainly in the winter months, and varies from 30 inches on the northern shores to 10 inches in the south.

The region around Trieste has an abnormally heavy rainfall, viz. 80 inches annually. In the north of the Mediterranean zone there is usually one summer month without rain, but in the south, as in Tripoli, there may be as many as seven dry summer months. The climatic conditions also change from west to east, the range of temperature increasing, and the total annual rainfall decreasing from Gibraltar to Palestine.

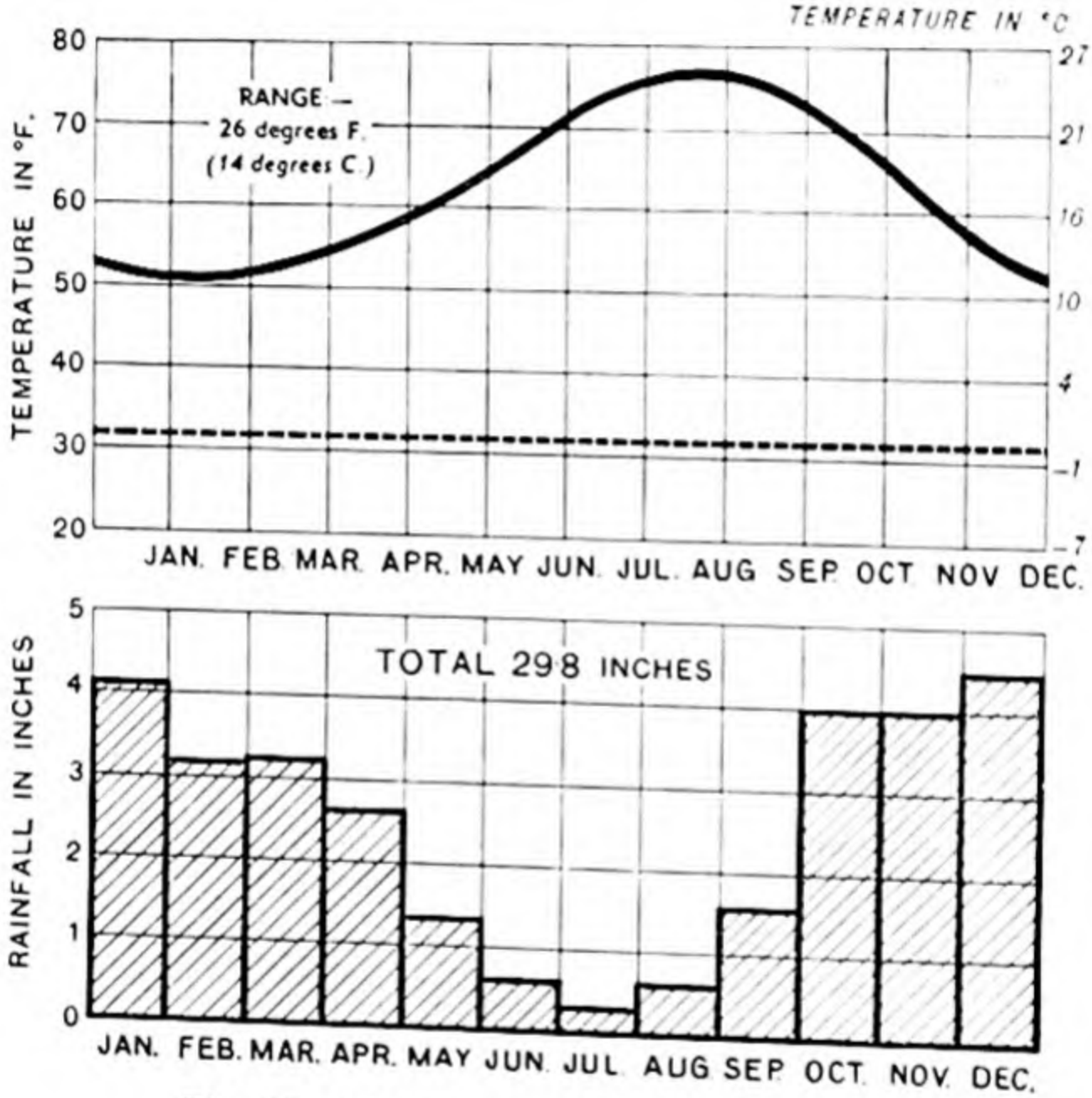


Fig. 18. MEDITERRANEAN TYPE. PALERMO.

The natural vegetation may be classed as broad-leaved evergreen forests. The trees are compact and woody, and the leaves often thick and glossy. The characteristic trees and shrubs are cork oak, olives, pines, cedars, cypress, laurels, myrtles, etc. There is little rich pasture land, for the summer drought prevents the growth of luscious green grass.

Three regions have already been noted as not conforming exactly to the Mediterranean type of climate—

(*a*) Central Spain is a dry plateau subject to extremes of temperature.

(*b*) The mountains of Yugoslavia are subject to greater extremes of temperature than the true Mediterranean areas.

(*c*) The Northern plain of Italy has rain in summer (convectional) as well as in winter and it also has greater

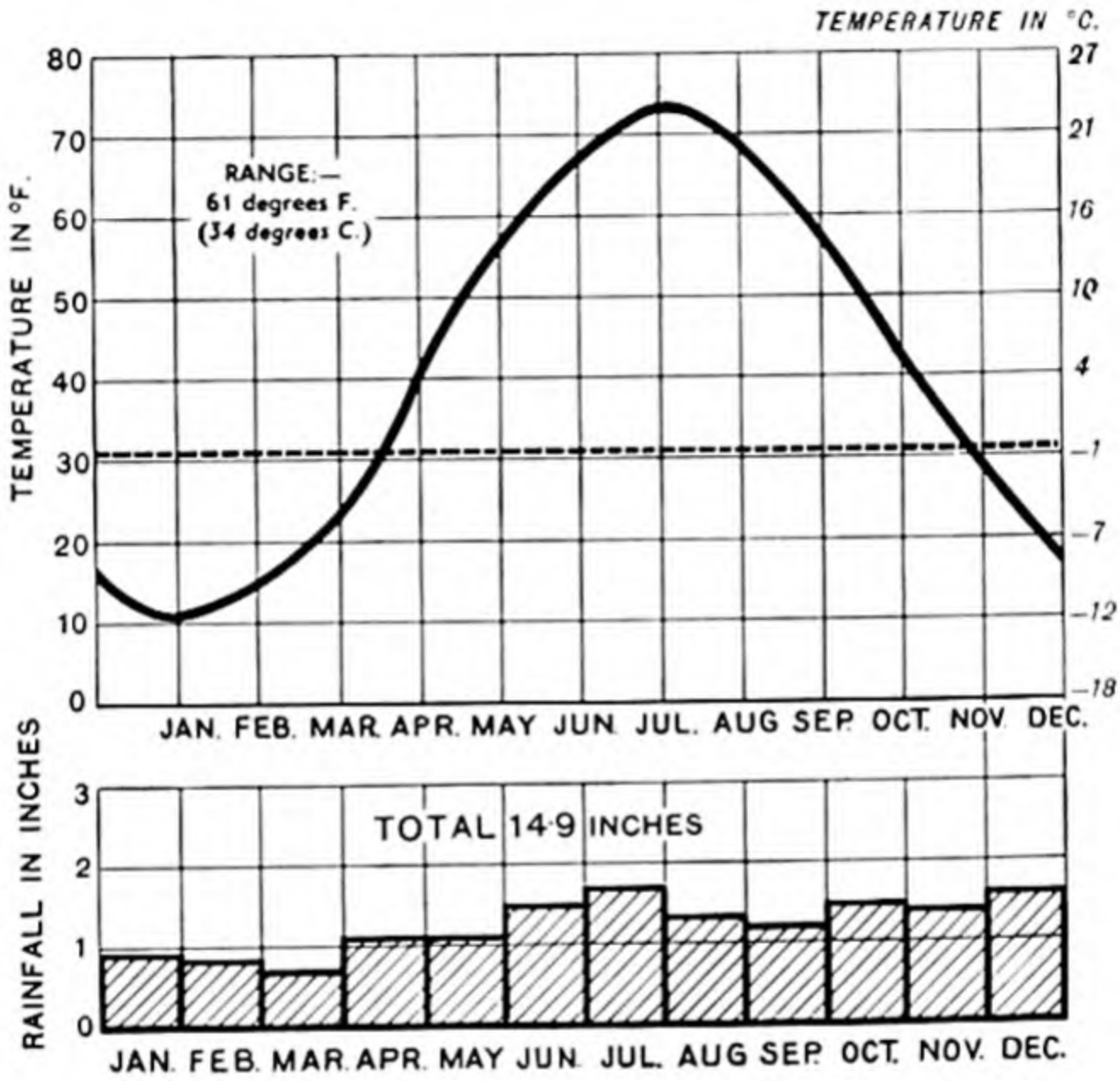


Fig. 19. Steppe Type. Saratov.

extremes of climate, because it is cut off from the tempering influences of the sea by the Appenines.

The Warm Temperate Continental Area or Steppe Type (Fig. 19).—This region includes the plains of Southern Russia, the plains of the lower Danube in Roumania, and the mountain-girt plains of the Middle Danube Valley, *e.g.* Hungary and North-Eastern Yugoslavia.

Far removed from sea influences, these are regions of great extremes of temperature. The average summers are hot,

usually over 70° F. (*21° C.*) in July. The average January temperatures are below freezing point [32° F. (*0° C.*)]. The rainfall is light and usually below 20 inches, falling mainly in spring and early summer. East of the Black Sea and around the north of the Caspian Sea the rainfall is scanty, and the region is one of very poor steppe or semi-desert.

The natural vegetation is grass, for the rate of evaporation during the hot summers is high, and there is insufficient ground water for the growth of trees. Along the rivers, however, willows, poplars, alders, etc., are sometimes to be seen.

CHAPTER II

GENERAL ECONOMIC GEOGRAPHY

THE RESOURCES OF EUROPE

Agriculture

Three important agricultural zones may be distinguished in Europe, but naturally there will be considerable overlapping at their edges. They are—

(1) The Mediterranean region.

(2) The North-West of Europe and the North Central Lowlands.

(3) The Eastern Lowlands.

(1) The Mediterranean region, with its dry, sunny summers, produces large quantities of fruit, viz. olives, oranges, lemons, peaches, apricots, pomegranates, almonds, chestnuts, etc. Wheat and barley are important cereal crops, but maize is also grown, and even rice in irrigated areas (*e.g.* the valley of the River Po). Because of the summer drought and high temperatures there are few rich green pastures, and cattle-rearing and dairy produce are unimportant, but large numbers of sheep and goats are reared on the dry pastures of the mountain slopes, especially in Spain and the Balkan peninsula.

(2) The agricultural lands of North-West and North Central Europe are mainly concerned with rotation farming, each farm producing a variety of crops. In the regions nearest to the Strait of Dover, viz. South-East England, North France, Belgium, Holland, Denmark and Western Germany farming is highly intensive, so that the biggest possible agricultural return is obtained from the land. Eastward the farming becomes less intensive, and gradually merges into the region of the eastern plains. Temperate cereals, viz. wheat, oats, barley and rye, are all cultivated, and the highest average yields of wheat per acre in the world are obtained; in Denmark

31 cwt per acre, Belgium 28, Netherlands 27, England 24, and Germany 23.

Flax is grown for its fibre, especially in North France and Belgium, and sugar beet production is also of outstanding importance. The use of beet pulp for cattle feeding is an important feature of the agricultural economy. Not only does this region produce great quantities of a variety of crops but it includes also some of the highly-organised dairying regions of the world. Denmark, Belgium and Holland have

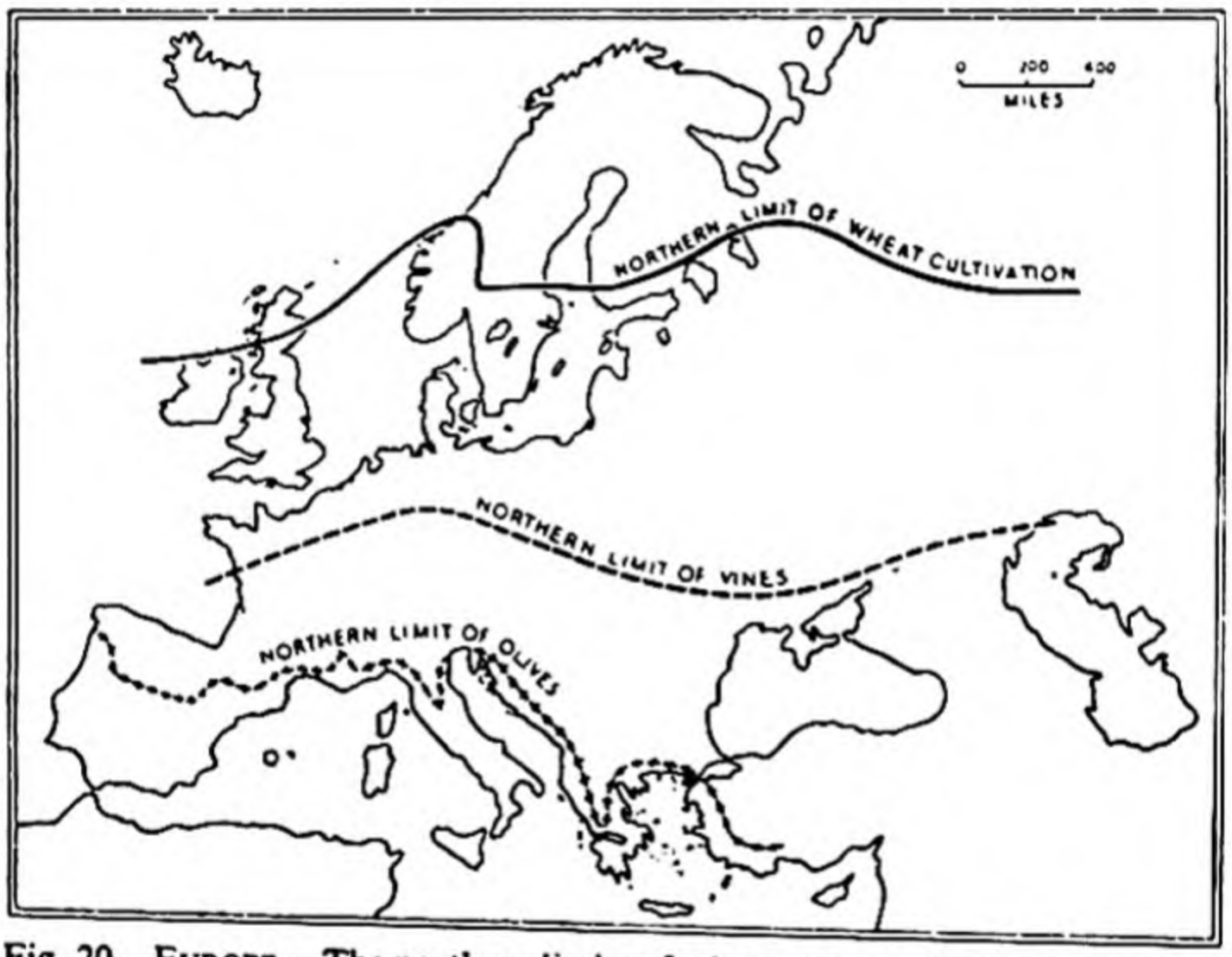


Fig. 20. EUROPE.—The northern limits of wheat, vine, and olive cultivation.

more cattle per square mile than any other countries, and their output of dairy produce for use in the neighbouring industrial areas is extremely high. In these productive countries sheep-rearing is of minor importance, except on the highlands of the British Isles, which have more sheep (250) per square mile than any other country in the world.

(3) Eastward through Poland there is a gradual change in the type of farming, until in the Russian plains rotation farming gives place to what is virtually one-crop farming. This tendency towards limited production is partly the result

of the short summers. The principal crops are rye and flax in central Russia, and wheat further south. The one-crop system leads to poverty and a low standard of living, and to a poor yield per acre (*e.g.* 7-9 cwt per acre, as compared with 24-30 in Western Europe). The agricultural organisation of the Russian Plains has, however, changed considerably since 1928 (see Ch. XXI).

Minerals and Industries

Europe west of the Urals produces roughly one-half of the mineral wealth of the world. The importance of mining is sometimes overlooked, because it is overshadowed by the

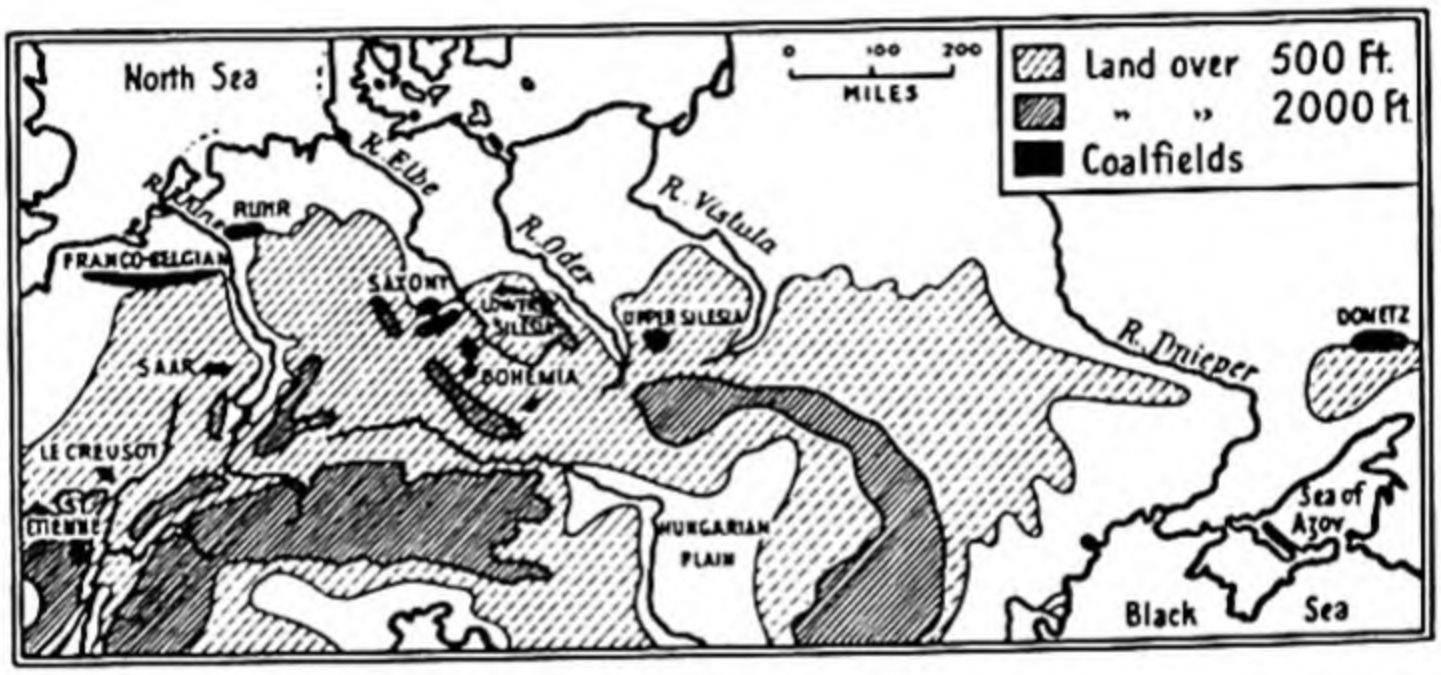


Fig. 21. THE PRINCIPAL COALFIELDS OF THE MAINLAND OF EUROPE SHOWING THEIR RELATION TO THE HIGHLAND AREAS.

great development of manufactures and commerce, which are the result of the abundance of minerals.

COAL.—Europe produces about 40 per cent. of the world's coal. In general the most important coalfields of Europe (outside Britain) are situated along the southern edge of the great European Plain, where the newer rocks of the plain meet the older rocks of the highlands (Hercynian system). This line of coalfields (Fig. 21) includes—(1) the coalfields of North France, (2) Belgium, (3) the Campine coalfield of South Holland, (4) the Ruhr coalfield, (5) the Saxony coalfield and (6) the Silesian coalfields. Apart from these there is an extensive coalfield in the south of the Russian Plain (Donetz

basin) and other smaller areas in the Saar basin, the margins of the central plateau of France and North Spain.

IRON ORE.—The six outstanding regions of iron ore production are in:—

(1) U.S.S.R., at Krivoi Rog, Kursk and at Magnitogorsk.
(2) Lorraine, in Eastern France.
(3) Southern Sweden, at Grängesberg and Ridderhytten.
(4) Northern Sweden, at Gellivara and Kiruna.
(5) England, in the Jurassic escarpment.
(6) North Spain, near Bilbao.

OTHER MINERALS.—Europe also produces large quantities of other minerals, viz. oil in the Caucasus, the Urals and Roumania; zinc in Italy, Spain and South Poland; lead in Yugoslavia, Germany, Spain and Italy; mercury in Italy and Spain; platinum and copper in the Urals; potash in Germany and France; sulphur in Sicily and France; aluminium ore (bauxite) in France, U.S.S.R., Yugoslavia, Italy, Greece and Hungary; and natural gas in the U.S.S.R., Italy, France and Roumania. In proportion to her area, Europe produces more than four times her share of more than half the important minerals, but her supplies of gold, silver, tin, nickel and uranium are insignificant.

Industries

The greatest manufacturing region in the world is centred in North-West Europe on the coalfields of—(1) Britain, (2) North France, (3) Belgium and (4) Germany and the neighbouring regions. The industries include not only iron, steel and other metal goods of every description, but textiles (silk, cotton, linen, wool and rayon), chemicals, pottery, glass and industries based on agriculture, such as the refining of sugar, the distillation of alcohol, etc.

In some industrial regions distant from the coalfields, manufacturing has developed because of the use of hydro-electricity as a source of power. Such districts are—(1) the north plain of Italy, (2) Switzerland, (3) Scandinavia.

Lesser manufacturing districts are centred around Barcelona, Lyons, Warsaw and in the Netherlands.

It should be noted that great industrial changes have taken place in Russia, and that (1) the Moscow region, (2) the Donetz region, and (3) the Southern Urals must now be included among the major manufacturing regions of Europe.

THE MAIN HIGHWAYS OF EUROPE

Ocean Routes

Europe is well served by ocean routes to all parts of the world. This is due—(1) to the industrial activity of Europe, which produces a large surplus of manufactured goods for export, and a need for the importation of large quantities of food and raw materials.

(2) To the peninsular shape of Europe which gives all countries, except two, access to the sea, and even those, Switzerland and Hungary, are linked to the sea by internationalised rivers.

(3) To the mildness of the winters because of which the large majority of European ports are ice-free throughout the year. The only ports closed by ice are those on the Baltic coasts and on the shores of the Black Sea (all of which can be kept open most of the winter by means of icebreakers), and Archangel on the White Sea. The most northerly port of Russia, Alexandrovsk, is completely ice-free because of the warming effect of the North Atlantic Drift but the northern sea route from Murmansk to Vladivostok, recently developed by the U.S.S.R., is open only three months a year.

Railway Routes

As is to be expected, the main trunk railway routes of Europe are controlled by the relief. As far as possible they follow the lowlands and river valleys, using natural gaps. But the Alps are a difficult barrier between North and South Europe and the crossing of them involved the boring of long tunnels, viz. the Simplon, Mont Cenis, Lotschberg and St. Gotthard tunnels (see Fig. 78).

Paris is the great western centre from which all the main routes radiate (Fig. 22). The principal ones are—

(1) The route to Calais, Dover, London and the remainder of Britain.

(2) The "Sud" Express route, which crosses the western lowlands of France to Bordeaux, thence passing round the western end of the Pyrenees to reach Madrid, Lisbon and Gibraltar.

(3) The P.L.M. route (Paris–Lyons–Mediterranée) to the Mediterranean, which follows a tributary of the Seine (the River Yonne) and crosses the Côte d'Or by a gap to Dijon. From Dijon southwards it follows the Rhone corridor to Marseilles. This is probably the most important railway route in Europe, for by using it passengers from Northern

Fig. 22. THE PRINCIPAL MAIN RAILWAY ROUTES OF EUROPE. These routes should be followed on a relief map.

Europe can pick up eastern-bound ships at Marseilles, and thus not only save time, but avoid the stormy journey across the Bay of Biscay.

(4) The routes to Italy. The first main route is the same as (3) as far as Dijon, whence the route crosses the Jura Mountains. This route then crosses the Alps by the Lotschberg and Simplon tunnels to Milan, whence routes radiate to Rome and Brindisi. A second route to Italy follows the Saône valley to Lyons and crosses the Western Alps via the Mont Cenis tunnel to Turin.

(5) The Orient Express route. This is probably the most spectacular of all European routes, as it links up the capital cities of many countries. From Paris it follows the Marne valley and goes through the Saverne gate north of the Vosges Mountains to Strasbourg. Thence it crosses Southern Germany and reaches Vienna via the Austrian gate between the Bohemian plateau and the Alps. Following the Danube valley it passes in turn through Budapest and Belgrade. South of Belgrade it follows the Morava valley through Nish, crosses the watershed to Sofia, and then descends the Maritza valley as far as Adrianople, whence it continues south-east to Constantinople. An extension of this great route, *i.e.* the famous Bagdad railway through South-Western Asia to Basra on the Persian Gulf, was part of a great scheme to give quick rail communication between the industrial areas of North-West Europe and the Far East.

(6) The great route of the North European plain, which runs from Paris through Berlin and Warsaw to Moscow, where it links up with the Trans-Siberian railway. From the point of view of relief this is the easiest of all the routes.

These routes should be carefully followed on a physical map, so that their relation to the relief may be fully realised.

Airways

The capitals of all the western countries of Europe are linked by air routes, and services now exist between the principal cities within these countries. Prestwick, Shannon and London are the main airports in Britain used for trans-Atlantic flights. The position of Iceland on the great circle route to North America has considerably increased the importance of that island. There are trans-polar air routes between Copenhagen and San Francisco via Sondre Stromfjord (Greenland), and between Copenhagen and Tokyo via Anchorage (Alaska), and others are being developed. Lisbon has also become a prominent base for services between Europe and the Americas. The countries with overseas empires, particularly Britain, France and Holland, maintain regular services for passengers and mails between the homelands and the chief centres within their empires.

POPULATION IN EUROPE

Distribution

The distribution of population in Europe varies according to relief, climate, and agricultural and industrial development. In comparison with its size, Europe has greater population than any other continent, *i.e.* its average density of population is higher than that of the other continents. This population is, however, unevenly distributed, so that there are some areas which are almost uninhabited (*e.g.* the mountains of Norway), and others with a phenomenal density of population, as, for example, the Belgian coalfield (Fig. 23). There are three types of regions with a scanty population of less than 26 people per square mile, viz.—

(*a*) The Tundra, where low temperatures retard development.

(*b*) Mountainous areas which are cold, damp and inaccessible, *e.g.* the mountains of Scandinavia and the higher parts of the Alps, Carpathians and Caucasus Mountains.

(*c*) The semi-arid lands of South-East Russia, where lack of moisture hinders production and settlement.

Dense population (over 256 per square mile) is associated with the industrial areas, and with the most fertile lowlands where intensive agriculture is practised.

The principal areas of dense population are—

(1) A narrow strip extending from the Ukraine (South Russia) westwards along the southern edge of the European Plain to Belgium and Northern France (Fig. 23). This region approximates to the line of coalfields, and the density of population is due to the industrial development and the intensive agriculture of the immediate neighbourhood.

(2) A second belt of dense population extends from the mouth of the Rhine southwards up the Rhine valley to the north of Switzerland. This is due to the importance of the river as a natural highway and the agricultural wealth of its valley.

(3) The northern plain of Italy and portions of the coastal plains of peninsular Italy, especially around Florence, Rome and Naples. This concentration is partly due to industrial development, and partly to intensive agriculture.

Fig. 23. Distribution of Population in Europe (Simplified).

Above Gorge of the River Tarn in the western Central Plateau. Note the narrowness of the gorge, the perpendicular walls of bare rock, with horizontal stratification. Similar scenery can be seen in all limestone regions. (*French Government Tourist Office.*)

Below Le Puy, in the Auvergne, showing the remains of a lava plug that once filled the vent of a volcano. The softer surrounding material has been eroded away. There are many such "puys" in this area of ancient volcanic activity. (*Compagnie Aerienne Francaise.*)

...sse country (see p. 47). Notice the very thin soil and scanty vegetation, limeston... on the surface, the absence of surface water, and of trees, except along the roa... Soil is and is unfit for cultivation but will provide rough grazing for sheep and goat...
(French Government Tourist Office)

Below A French vineyard (Clos Vougeot). *(French Government Tourist Office)*

(4) The Douro plains of Portugal around Oporto, due to intensive agriculture and vine cultivation.

(5) North-Eastern Spain around Barcelona, an important manufacturing centre.

(6) The Rhone valley from Dijon southwards, an area associated with vine cultivation, and the industrial centres of Lyons and Marseilles.

Within the areas outlined above are a few special regions where the population exceeds 512 per square mile. These are—

(1) The Franco-Belgian coalfield.

(2) The Ruhr valley.

(3) The Saxony coalfield.

(4) Most of the southern half of Holland.

(5) Portions of the North Italian plain.

With the exception of Holland all these regions are highly industrialised.

In addition to the above all the principal cities, such as Paris, Vienna, Hamburg, Naples, Zurich, Barcelona, Lyons and Marseilles, are centres of small areas of extremely dense population, due to the attraction of people to the industries of those cities.

It is noteworthy that only three countries, viz. England, Belgium and Holland, have an average density of population exceeding 500 per square mile *for the whole country*. This is due to a combination of industrial development and scientific agriculture, and, in Holland, to the great fertility of the alluvial soils and the absence of large unproductive areas.

The Peoples of Europe

"Race" is a term that is often misused. Racial characteristics are those physical traits, such as stature, colour of skin, type of hair, and shape of, *e.g.* eye, nose, lips or head, that are transmitted by heredity from one generation to another.

It is incorrect to use the term race to describe people having a particular nationality, speaking a given language or groups

of associated languages, or having a common cultural tradition. The terms "nation" or "people" should be used in such cases, *e.g.* the Spanish nation, the Latin-American peoples, etc.

While it is not too difficult to distinguish certain major races, *e.g.* negroes and white people, it is far from easy to decide on the subdivision of the major races, particularly as the dividing lines are so blurred by interbreeding. In Europe especially, after centuries of intermingling and intermarrying, there is nowhere anything approaching a pure race. Nevertheless, it is still possible to trace areas in Europe where certain physical traits, corresponding to three former important subdivisions of the white race, are found with greater frequency than elsewhere.

These three subdivisions of the white race are known as—(1) the Nordic people, (2) the Mediterranean people, and (3) the Alpine people. It is beyond the scope of this book to discuss the origin of these peoples, but it may be noted that the generally accepted idea is that they drifted westward into Europe from the plains of Central Asia.

(1) The Nordic people are tall, fair-haired, blue-eyed, fair-complexioned people with long skulls. They are found in the North-Western parts of Europe, in Denmark, North Germany, Holland, Scandinavia and Britain. Their characteristics are their inventive genius and their energy and ability to plan and carry through great schemes.

(2) The Mediterranean people also have long skulls, but they are shorter in stature, dark of hair and complexion, and brown-eyed. They are found in all the countries bordering the Mediterranean Sea, but also occur in small numbers in the west of Ireland and the west of Scotland, possibly the result of settlement by the early Phoenician traders. In these people the poetic and artistic temperament is highly developed.

(3) The Alpine people are medium to dark in colouring, have broader skulls, and are more sturdily built than the Nordic and Mediterranean types. Their salient characteristics are patience, perseverance, and a capacity for hard work. They are found chiefly in the mountainous areas of Central and Eastern Europe.

The so-called Slav peoples of Eastern Europe and Asia speak languages all derived from a common language, just as modern Italian, French and Spanish, are all derived from Latin. The original Slav tongue was spoken by a people who lived to the north-east of the Carpathians and who were largely Alpine in racial make-up. These people increased in numbers and migrated, some eastwards and some westwards. During westward migration the Slavs divided into two main streams.

One followed the route to the north of the Carpathians, where they formed the north Slav group, which includes the Czechs, Slovaks, Moravians, Ruthenians and Poles.

The stream following the route south of the Carpathians formed the south Slav group of the Balkan countries, and includes Croats, Slovenes, Slavonians, Serbs and Bulgarians. A third stream spread north-eastwards into Russia, where Slav peoples make up more than three-quarters of the total population.

In the Hungarian plains, separating the North and South Slavs are the Magyars of Hungary, descendants of steppe peoples from Asia. Practically the whole of the Russian plain is inhabited by Slav peoples, but to the north the Lapps and Finns, and to the south, the Turks, show some traces of Mongolian origin.

The political divisions of Europe do not correspond to true racial groups, but, by the Treaty of Versailles (1919) the limits of the new Danubian states were fixed, as far as possible, by language distribution. Thus, as far as was practicable, all areas where Czechs (who speak a Slav language) formed a majority of the population were included in the state of Czechoslovakia, and were separated from the Germanic-speaking people of Austria. This plan, at first sight, seemed ideal, but the regions occupied by such language groups do not necessarily coincide with convenient economic or geographical units, and also powerful language minorities are still included within the same political area. It was the existence of these strong minorities in the countries of Central and South-Eastern Europe that gave rise to recent political problems. During and after the war of 1939-45 there were a number of forced migrations of such minorities (see, *e.g.* pp. 140, 142).

CHAPTER III

THE COUNTRIES OF THE NORTH-WESTERN MARGINS OF EUROPE: (1) FRANCE

The Position of France and Her Frontiers

The countries of North-Western Europe are France, Belgium, Holland, Denmark and Norway. They are grouped together because, except for the south of France, they are climatically similar, and fall within the major natural region defined as the Western Margin Region of the Cool Temperate Belt (see page 17).

France stands astride the western portion of Europe stretching from the Mediterranean to the English Channel. This is a great advantage, for the northern and western sea coasts give France direct access to the countries bordering the North Sea, and to the open Atlantic and America, while the southern coast provides contact with the important Mediterranean-Suez route to the East. By virtue of this south coast, France, in contrast to the other countries of North-Western Europe, is saved the expense of the long sea journey via Gibraltar.

While the sea accounts for a large proportion of her frontier, part of the southern and all the eastern side of France have land frontiers. In the south the high sierra ridge of the Pyrenees separates France from Spain. The absence of easy passes makes this an effective barrier and until recently the only railway routes from France into Spain passed around the western and eastern ends of these mountains. In 1928 a railway route across the Central Pyrenees was completed between Pau and Saragossa, involving the cutting of sixteen tunnels, the chief of which is the Somport.

The eastern frontier of France falls into four sections—

(1) The Franco-Italian frontier between the Mediterranean and Lake Geneva, where the boundary follows the watershed of the high Western Alps.

(2) The Franco-Swiss frontier from Lake Geneva to Basel (Basle). The section of the boundary follows the ridges of the Jura Mountains.

(3) The Franco-German frontier between Basel and the buffer state of Luxemburg. In the south of this section the boundary follows the River Rhine to a point about 50 miles north of Strasbourg, where it turns slightly north of west across an upland region. This is one of the critical sections of the French frontier, both because of the age-long struggle for the Rhine, and because the uplands are broken by gaps and river valleys which have to be strongly defended (*e.g.* the Moselle valley with the fortress of Metz).

(4) The Franco-Belgian frontier which strikes north-westward from Luxemburg to the coast near Dunkirk. The eastern half of this frontier is an upland region broken by the deep valley of the Meuse near Sedan, the site of the decisive battle of the Franco-Prussian War in 1870 and of the German break-through in May, 1940. The western half of this frontier follows no natural feature, but cuts across the narrowest portion of the north European plain between the Ardennes and the sea. The difficulty of adequately protecting these lowlands facilitated the German attacks against France in 1914 and again in 1940.

The Physical Features of France

The dominant feature of the relief of France is the Central Plateau, situated in south Central France, and occupying about one-sixth of the area of the country. Within its limits rise the headstreams of the four great rivers, Seine, Loire, Dordogne and Garonne, whose extensive lowland plains encircle the plateau on the north and west from the Belgian border to the Pyrenees. Beyond these plains, in the extreme west of France, is the hilly district of Brittany. On the south the Central Plateau is fringed by the Mediterranean coastal plain, and on the east by the narrow north to south corridor of the Rhone-Saône valley. Thus the Central Plateau is bordered by lowlands on all sides except the north-east, where lower and more broken uplands extend to the German frontier. East of the lower Rhone valley are the Western Alps drained by two large tributaries of the Rhone, the Isère and Durance. The Pyrenees, also mountains of the Alpine type, are in the extreme south of France on the Franco-Spanish border.

Climate of France

France is situated on the western margin of Europe, partly in the cool temperate zone and partly in the warm temperate zone. Generally speaking, its climate is therefore of a maritime type, especially in the west. Towards the eastern borders and in the highland areas, however, continental influences make themselves felt, so that the temperatures are slightly more extreme and the rainfall lighter than in the west, except on the mountains (*e.g.* the Vosges, Cevennes and Jura) where there is heavy relief rain.

France may be divided into three major climatic provinces (Fig. 24).

(1) The North-West of France, including the Paris Basin, Aquitaine and Brittany.

(2) The Mediterranean coastal plain and the lower Rhone valley nearly as far north as Lyons.

(3) The mountain and plateau zone separating regions (1) and (2) where temperature and rainfall are both modified by altitude.

The salient characteristics of these climatic provinces are shown by the following figures:—

APPROXIMATE CLIMATIC DATA FOR SELECTED TOWNS IN FRANCE.

	TEMPERATURE Degrees Fahrenheit and *Centigrade*				RAINFALL Inches		
PLACE	July	Jan.	Range	Mean Annual	Win.	Sum.	Total
1. Nth. Western Zone							
(*a*) Nantes	65 (*18*)	40 (*4*)	25 (*14*)	52 (*11*)	15	10	25
(*b*) Paris	65 (*18*)	36 (*2*)	29 (*16*)	50 (*10*)	9	11	20
(*c*) Bordeaux	68 (*20*)	41 (*5*)	27 (*15*)	54 (*12*)	18	15	33
2. Mediterranean Zone							
Marseilles	72 (*22*)	43 (*6*)	29 (*16*)	57 (*14*)	13	8	21
3. Plateau Zone							
Clermont Ferrand	66 (*19*)	35 (*2*)	31 (*17*)	50 (*10*)	8	13	21

(1) The north-west of France has a climate typical of all regions with a West European type of climate, viz. equable temperatures and moderate rainfall falling at all seasons, but with a winter maximum. In so large an area as North-Western France there are, however, many variations in climate. The most equable and rainiest region is Brittany (*e.g.* Nantes). From Brittany eastwards the range of temperature increases towards Paris and the Belgian border. The winter temperature of Paris is 4 F.° (*2 C.*°) colder than Nantes, the range is 4 F.° (*2 C.*°) greater, the rainfall is less, and the rainfall maximum is in summer, instead of in winter as at Nantes. These changes are indicative of the increasing influence of continental conditions, from A to B (Fig. 24). The climate also changes from Brittany southwards (in the direction AC, Fig. 24). Because of its more southerly position, the mean annual temperature of Bordeaux is higher than that of Nantes, but Bordeaux still has the low range of temperature and winter maximum of rainfall, characteristic of its oceanic position. Its heavier rainfall is due to the fact that it lies near a route which is frequently followed by depressions (see again the winter conditions in Europe, page 10, and the map, Fig. 8).

Fig. 24. FRANCE. CLIMATIC REGIONS.

(2) The Mediterranean coastlands and the lower Rhone valley have a Mediterranean type of climate, as exemplified by the figures for Marseilles, viz. hot summers, cool winters and the bulk of the rain falling in the winter half-year. Mean temperatures are higher in this region than in any other part of France.

(3) In the upland region of France climatic conditions are more continental in type than elsewhere in the country.

Because the region is remote from the sea, the summers are hot in spite of the altitude (Clermont 66° F.). The winters are often bitterly cold, and snow is not uncommon. The maximum of rainfall is definitely in summer, a marked continental feature.

The Natural Divisions of France

As a result of the relief and climate variations France may be divided into the following natural regions (Fig. 25).

(1) The North-West Peninsula (Armorica).

(2) Aquitaine.

(3) The Paris Basin and the North-East.

(4) The Central Plateau.

(5) The Eastern Borderlands.

(6) The Rhone-Saône valley.

(7) The Mediterranean region and Corsica.

(8) The Western Alps.

Each of these regions is described in detail in the sections which follow.

Fig. 25. FRANCE. NATURAL DIVISIONS.

The North-West Peninsula (Armorica)

The north-west of France is that region which lies west of a line from Caen to the Ile de Ré. It is composed of old rocks, granite, etc., and is similar in structure to Cornwall and Devon, being part of the ancient Armorican mountain system. The scenery of the granite moorlands of Central Brittany is very picturesque, and closely resembles Dartmoor. The coast line is rocky and rugged and indented by numerous drowned valleys of the ria type, so that the Bretons, like the people of Cornwall, have developed a fondness of seafaring,

and fishing is an important occupation. Brest, guarding the southern side of the entrance to the English Channel, is an important naval station (cf. Plymouth). Climatically, too, the region is very similar to South-West England. The equable temperatures and heavy, well-distributed rainfall give rise to luxuriant pastures. Cattle-rearing and dairy farming are therefore of great importance. Except for that part of the region which lies south of the River Loire, North-Western France is too cool in summer for vine cultivation (see Fig. 34). As in Cornwall and Devon, there are extensive apple orchards, and cider is manufactured. Market gardening is another important branch of agriculture, because of the absence of late frosts, and large quantities of strawberries are exported to England. The North-Western region is also an attractive holiday centre, partly because of its mild winters and picturesque scenery, and partly because of its interesting historical associations.

Culturally the Bretons differ from the rest of the people of France. Like the Cornish, Welsh and Irish, their language is of Celtic origin, and they are descendants of early peoples who were pushed westward by successive invasions from the east. In speech, traditions and customs the Bretons are very similar to the Welsh and Cornish, and in the hilly regions there is a wealth of ancient stone monuments similar to the ancient British circles, the most notable being at Carnac. Rennes, on the River Vilaine, and in the centre of a rich agricultural area, is the route centre and market town of Brittany.

Nantes (220,000, outport, *St. Nazaire*), at the lowest bridging point of the Loire, is connected with the sea by a canal which was built to avoid the shifting sandbanks of the estuary. It uses imported coal in its sugar refineries and flour mills.

Aquitaine

Aquitaine, the lowland of South-West France, includes the basin of the rivers Charente, Garonne and Adour. It is a roughly triangular plain rising to the Central Plateau on the east. It is connected with the Mediterranean coastlands by the narrow gap of Carcassonne between the Central Plateau and the Pyrenees; and north-eastwards with the

Paris Basin by the gate of Poitou between the Central Plateau and the Gatine, the latter being structurally part of the north-western highlands. The greater part of Aquitaine is a low plain of clayey alluvium, but the Charente basin is a limestone region. The coast of Aquitaine is remarkably straight, being composed of sand dunes, behind which are shallow lagoons. The low, marshy and sandy areas behind the dunes are known as the Landes. They are, by nature, infertile and of little use except as sheep pastures. In recent years much has been done to make this region more productive, firstly by draining the marshes, and secondly, by the planting of coniferous trees. These trees not only prevent the sand moving inland under the influence of the westerly winds, but also yield valuable supplies of turpentine and timber, especially pit props.

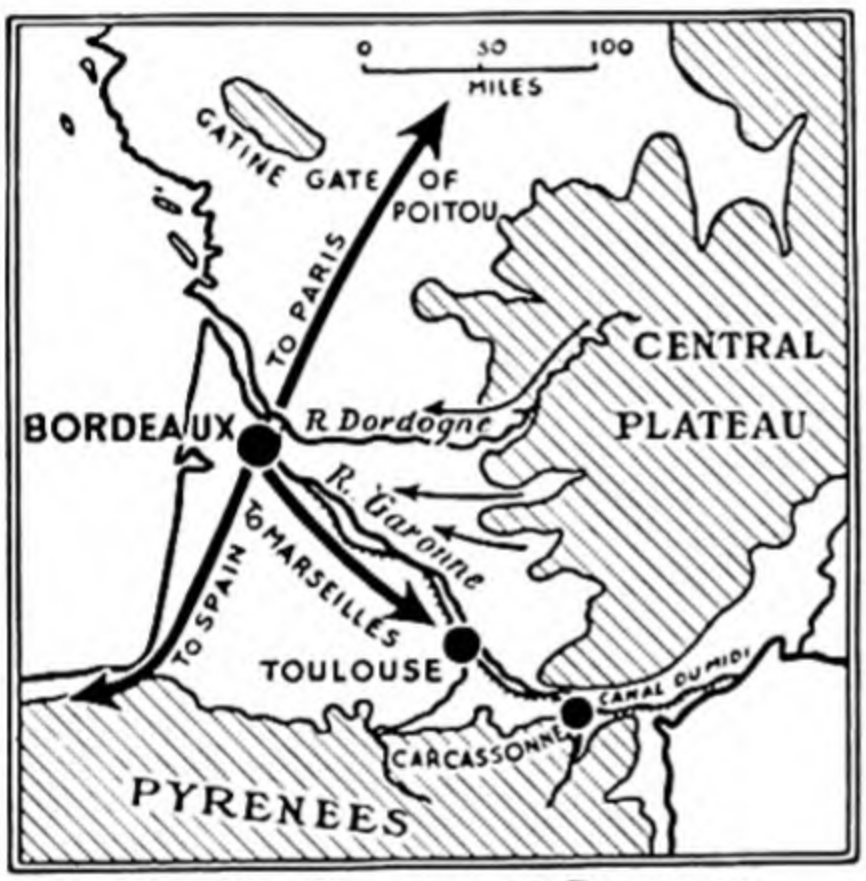


Fig. 26. Position of Bordeaux

Oil has been found near the Etang de Parentis, and in the foothills of the Pyrenees. Production is about one million tons a year. Natural gas is piped to Bordeaux, Toulouse, and to the Central Highlands and Paris. With cheap energy available, aluminium smelting (Péchiney), plastics, and other synthetic chemical industries have developed in the immediate hinterland of Bayonne. Production of sulphur from natural gas is already well over one million tons a year, making France second only to the U.S.A. as a producer.

Because of its high temperatures and evenly distributed rainfall, Aquitaine is a rich agricultural region. The Charente valley is noted for the production of wheat and vine, and the manufacture of brandy (Cognac) and light wines. In the Garonne valley maize, tobacco and wheat are grown, and the region is one of the most important wine-producing areas of France, specialising in the making of clarets.

Bordeaux (260,000, outport, *Pauillac*) (Fig. 26), at the lowest bridging point of the Garonne, is the chief collecting centre and port. In some ways it may be compared with Bristol, since its industries of sugar-refining, chocolate and cocoa manufacturing are based on its imports.

Toulouse (270,000), in the south-east corner of the lowland, controls the route via the Gate of Carcassonne to the Mediterranean. *Carcassonne*, at the eastern end of the "gate," is one of the most perfect and best-preserved examples of a mediaeval walled town.

In the south the plains of Aquitaine rise to the Pyrenees, famous for their scenery and for their mineral springs, which have given rise to such famous spas as Pau and Lourdes. Extending northwards from the Pyrenees is the fan-shaped plateau of Lannemezan, an infertile area composed of gravelly sediments deposited by ancient Pyrenean glaciers.

The Paris Basin

The Paris Basin includes not only the basin of the Seine, but also the basin of the River Somme and part of the middle Loire basin. Structurally it is very similar to the London and Hampshire basins in England (Fig. 27). It is a roughly circular syncline formed by the downfolding of alternate layers of limestones, clays and chalk. The limestones and chalk have resisted erosion, and stand as scarped ridges separated by clay vales. The steep slopes of the escarpments face outwards away from Paris (cf. the steep slopes of the North Downs and Chilterns relative to London). A simple idea of the structure may be obtained by imagining a nest of three saucers partly filled with water. The rims of the saucers represent the scarped ridges, and the surface of the water in the saucers the clay plains between the ridges. The scarped ridges are broken by wind and water gaps, so that Paris in the centre of the basin is the natural focus of all the routes passing through these gaps (cf. London). The central area of the basin is known as the Ile de France.

Like Aquitaine, the Paris Basin is a rich agricultural region, but the crops vary in importance from one district to another, largely because of varying soil conditions. *Beauce*, south-west of Paris, where fertile loess soils cover the chalk, is

famous for wheat-growing and sheep-rearing. *Brie*, north-east of Paris, is a region of heavier clays and is more famous for its cattle pastures and the cultivation of sugar-beet. South of Paris are large tracts of sandy soils, which give

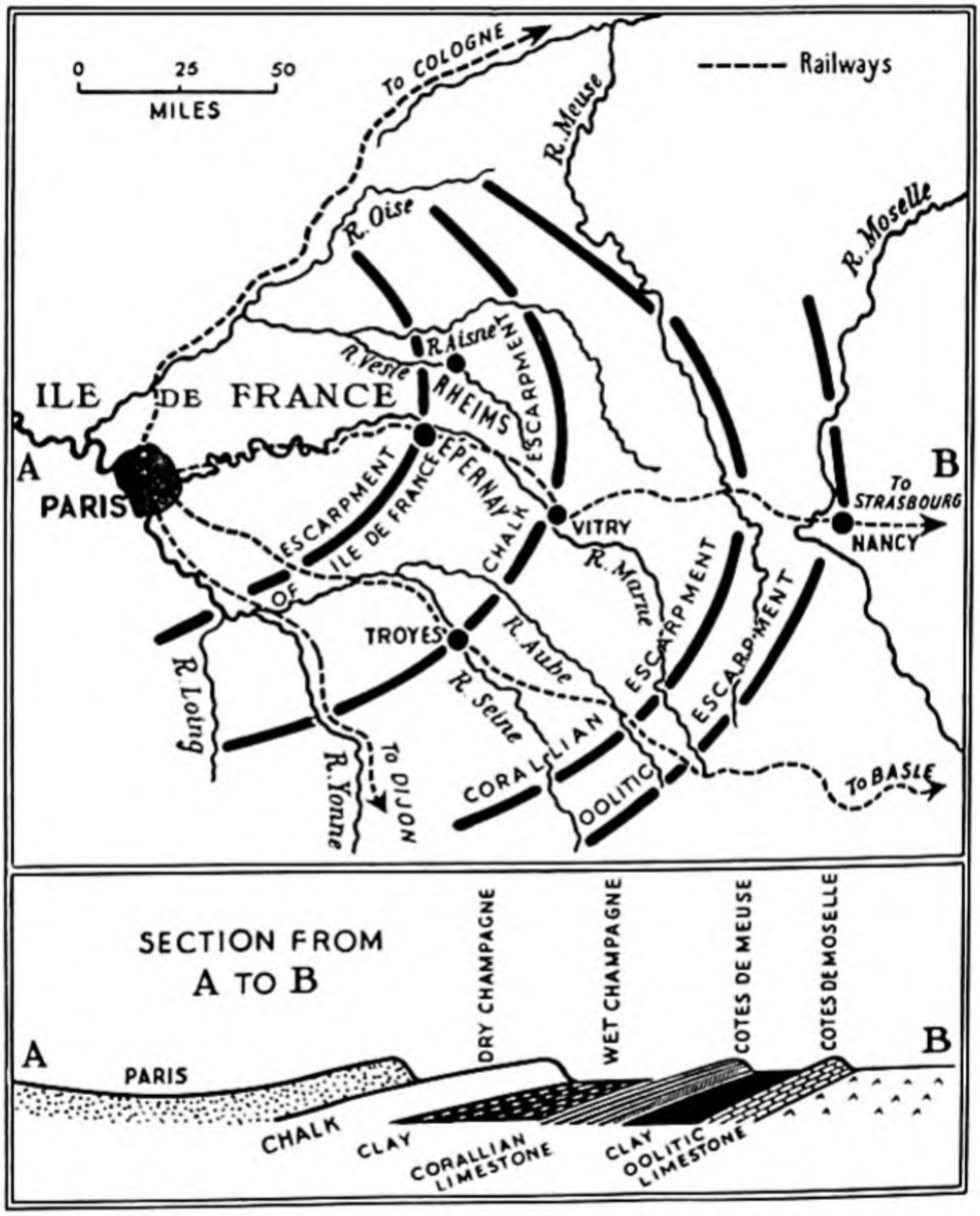


Fig. 27. THE SCARPLANDS TO THE EAST OF PARIS.

rise to forest lands as at Fontainebleau (cf. New Forest in the Hampshire basin). To the east of Paris the scarplands are used for sheep-rearing, and the intervening clay vales for vine cultivation. This region, known as Champagne, is one

of the richest wine-producing areas in the country. Rheims, commanding a gap in the clay ridge, is the chief town and market centre. Other gap towns are Troyes, Épernay and Vitry. North of Paris the summer temperatures are too low for vine cultivation and, as in Brittany, apples are extensively grown for the manufacture of cider (see Fig. 34). Dairy farming and the rearing of horses are both important because of the rich pastures due to the maritime climate and the clay soils which overlie the chalk.

Havre (140,000), at the mouth of the Seine, is the second port of France. It is primarily concerned with trans-Atlantic shipping, its chief imports being cotton and coffee. There is an oil refinery and a pipe-line to Paris for refined petroleum.

Rouen, at the lowest bridging point of the Seine, has historic interest, and is noted for cotton and linen manufactures.

Fig. 28. PARIS AS A ROUTE CENTRE.

Other important coastal towns are Dieppe, Boulogne and Calais, packet stations from which there are regular steamer services to England. The lowlands of the middle Loire are also rich wheat and vine lands, with the exception of the rather infertile and scantily-populated district between the River Loire and its tributary, the River Cher. There are three large market towns in the Loire basin, viz. Orleans, Angers and Tours. All three are important bridging points and route centres, but, in addition, Orleans is at the great bend of the Loire where that river is nearest to Paris.

Paris (2,850,000) is the great route centre of the whole of the area, and its importance throughout history has been primarily due to its control of routes—

(1) North-east via the Oise along the European plain.

(2) Eastwards via the Marne valley and the gaps in the escarpments to Strasbourg and Central Europe.

(3) South via the Yonne valley to Dijon and Marseilles.

(4) South-west via Orleans and the Loire valley to Aquitaine.

(5) Westwards to Brittany.

(6) Down the Seine valley to the coast.

Like London, it has an immense variety of small manufactures, mostly those connected with the demands of a large

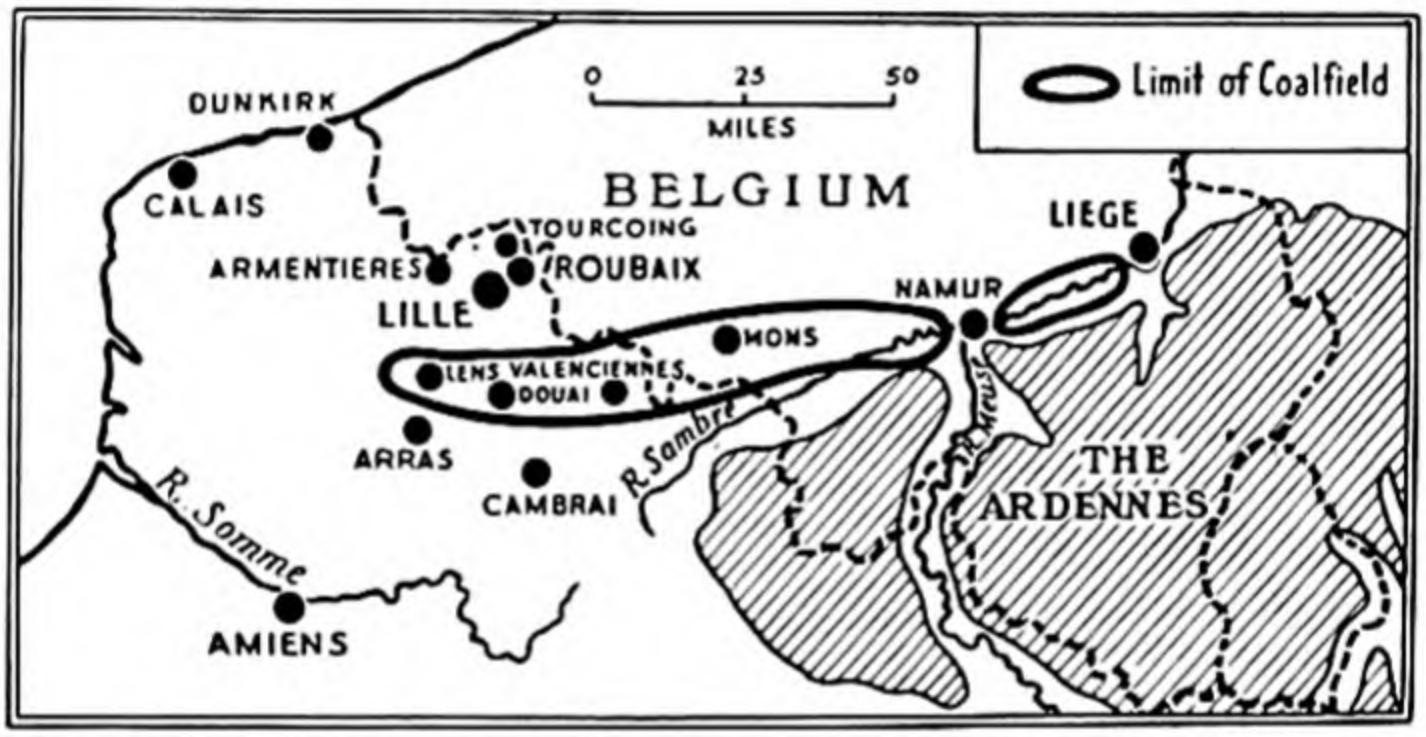


Fig. 29. North-Eastern France, Showing the Franco-Belgian Coalfield and the Principal French Manufacturing Towns.

urban population. It is the centre of the French car industry. Paris dominates France much more than London does England, for only seven French provincial towns have a population over 200,000.

The North-Eastern Industrial Area

The extreme north-east of France is also a rich agricultural area, specially important for hops, flax, sugar-beet and grain, but it is, above all, the great centre of industrial development. The coalfield of North-East France is a continuation of the Belgian coalfield, and extends westwards from the frontier near Valenciennes to Lens (Fig. 29). During the period of

post-war reconstruction the coal mines have been reorganised, and the equipment is now of the most modern type. There is a large variety of industries associated with this area, viz. textiles, such as linen (from local flax), cotton goods (using cotton imported at Dunkirk), and woollen goods. These industries date back to the Middle Ages, when the tapestries of Arras were world-famous. The chief textile centres to-day are Lille, Roubaix, Tourcoing and Armentières. In addition to their textile industries, Arras, Lille and Valenciennes have important engineering works. Sugar-refining (from local sugar-beet), brewing and glass-making are all important.

The Central Plateau

In south Central France is the Central Plateau which occupies about one-sixth of the total area of France. It is part of the ancient highland system of Central Europe. Most of this plateau, which averages 3,000 feet in height, is composed of ancient crystalline rocks.

In the north-west (the Auvergne) are the remains of old volcanic cones, known as "Puys" (see plate facing page 32), which rise high above the plateau level, *e.g.* Mount Doré (6,138 feet) and Cantal (6,096 feet). The western and south-eastern margins of the plateau are composed of limestone, and the scenery is of the "karst" type. These regions are known as Causses, and are characterised by deep valleys, caverns and disappearing rivers. Around the plateau are a few small basins of workable coal measures, *e.g.* at St. Etienne (180,000), Le Creusot, Alais, Décazeville and Commentry (Fig. 30). On its eastern side the plateau drops steeply to the Rhone valley, and is known as the Cevennes. The Central Plateau is one of the principal watersheds of France. From its north-eastern extension drain the Seine and some of its tributaries. In the eastern half of the plateau the upper courses of the rivers Loire and Allier flow through broad valleys. On the west the plateau is cut into long finger-like ridges by the parallel valleys of streams (*e.g.* River Lot; River Tarn) tributary to the Dordogne and Garonne (see plate facing page 32).

The agricultural activities of the Central Plateau vary considerably from place to place, large areas being unproductive on account of the altitude, severe winters and infertile

soil. In the limestone Causses, goat and sheep-rearing is of major importance, and gives rise to small industries of wool-weaving and cheese-making, the well-known Roquefort cheese

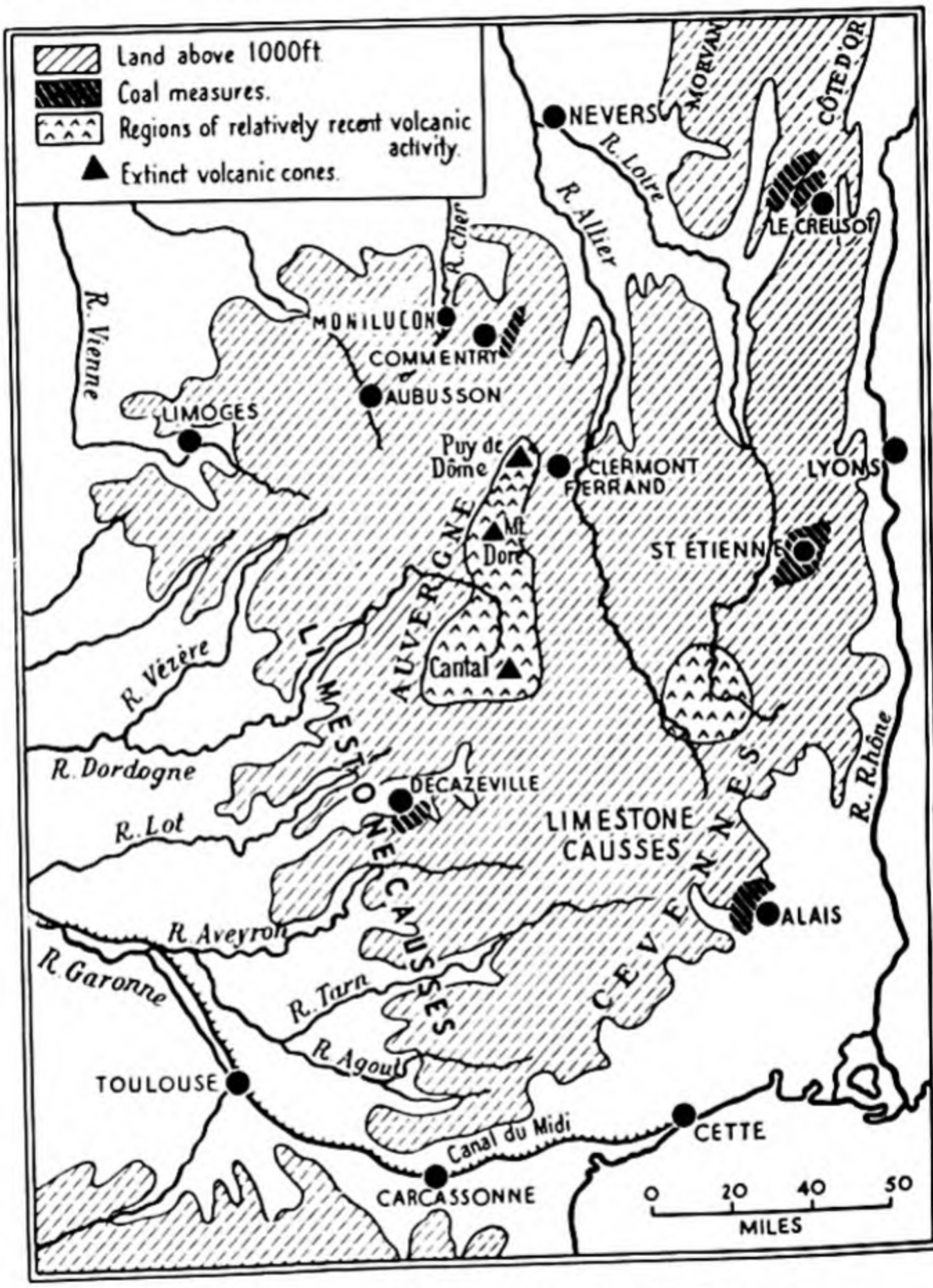
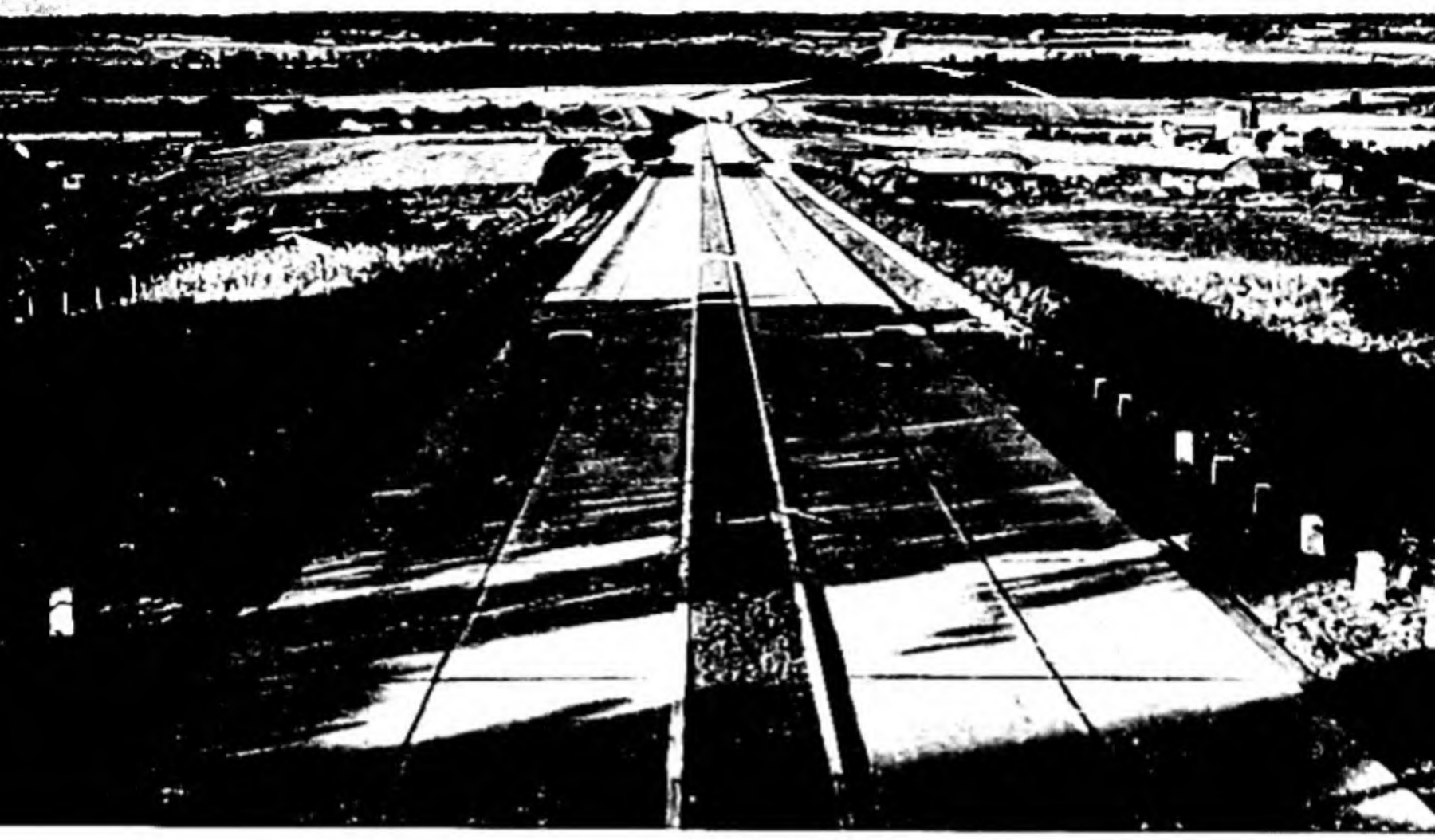
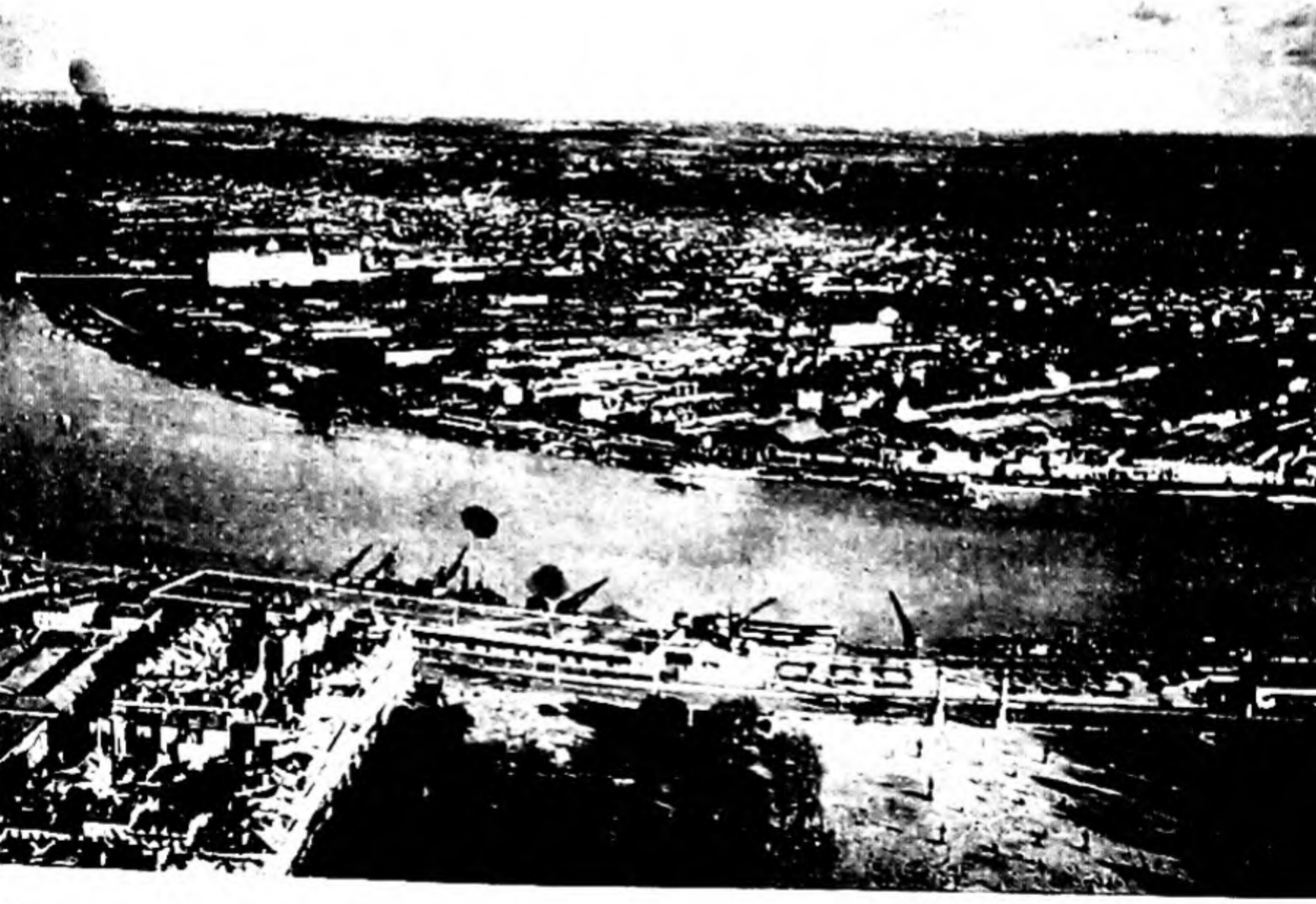


Fig. 30. THE CENTRAL PLATEAU OF FRANCE.

being made from goats' milk, while the carpets of Aubusson have been famous for centuries. The north-western portion of the plateau, with its ancient volcanic rocks, is infertile and scantily peopled. Limoges, noted for china made from local





Above A modern French arterial road, "l'auto-route de l'ouest" (*French Government Tourist Office*)

Below The river port of Bordeaux at the lowest bridging-point of the Garonne. (*Commissariat General au Tourisme*)

Above The coast of Belgium is low and sandy, fringed with dunes 20 to 30 feet high. Th
view is taken near Nieuport. (*Belgian State Tourist Office.*)

Below The Albert Canal joins Antwerp to the Meuse (Maas) near Liège. Completed
1938, it will take barges up to 2,000 tons. It was hoped also that it would form a defen
line against invasion from the east, but it proved of little use as a barrier in 1940. (*Belgi*
State Tourist Office.)

deposits of kaolin derived from the granite, is the most important town. Further east are the rich agricultural areas of the sheltered valleys of the Loire and the Allier. The soil of these valleys is enriched by the volcanic material carried down from the plateau, and large quantities of grain, sugar-beet and fruit are cultivated. The high regions surrounding these valleys are used as summer pastures for cattle. Clermont Ferrand (115,000) is the chief market centre, and is important for its rubber manufacture. The richest agricultural areas are those of the eastern and south-eastern slopes facing the Rhone valley and the Mediterranean coastlands.

The two most important coalfields of the plateau lie towards the eastern margin, viz.—

(1) Le Creusot coalfield, which is primarily engaged in iron and steel manufacturing.

(2) The St. Etienne coalfield, noted for its silk industries and the manufacture of armaments.

The swift streams of the Central Plateau are being harnessed for the production of hydro-electricity. The largest generating centre is at Marèges in the upper Dordogne valley, whence electricity is being carried over the whole of South-Western France to Bordeaux, Toulouse and the Pyrenees by a "grid" system. This scheme was inaugurated by the Paris–Orleans–Midi Railway for the electrification of its lines.

The Central Plateau is scantily populated in comparison with the rest of France. Its inhospitable climate (especially the winters), poor soils and difficult communications make it a region of difficulty, and there is a steady movement of people from the plateau to Paris and other large towns (cf. Wales and the Highlands of Scotland).

The Eastern Borderlands

This region comprises that part of France which lies between the River Meuse and the Rhine. It is low, broken plateau drained by the north-flowing Moselle and its tributaries. In the south-east are the Vosges Mountains, one of the old "blocks" of Central Europe. To the east of the Vosges the land drops steeply to the flat plains of the Rhine rift valley. This part of France is primarily important for its mineral

wealth (Fig. 31). In the north of Lorraine, immediately south of Luxemburg, are the largest iron deposits in Europe. Most of this rich iron field was annexed by Germany in 1870, but was regained by France in 1919. These ores are similar

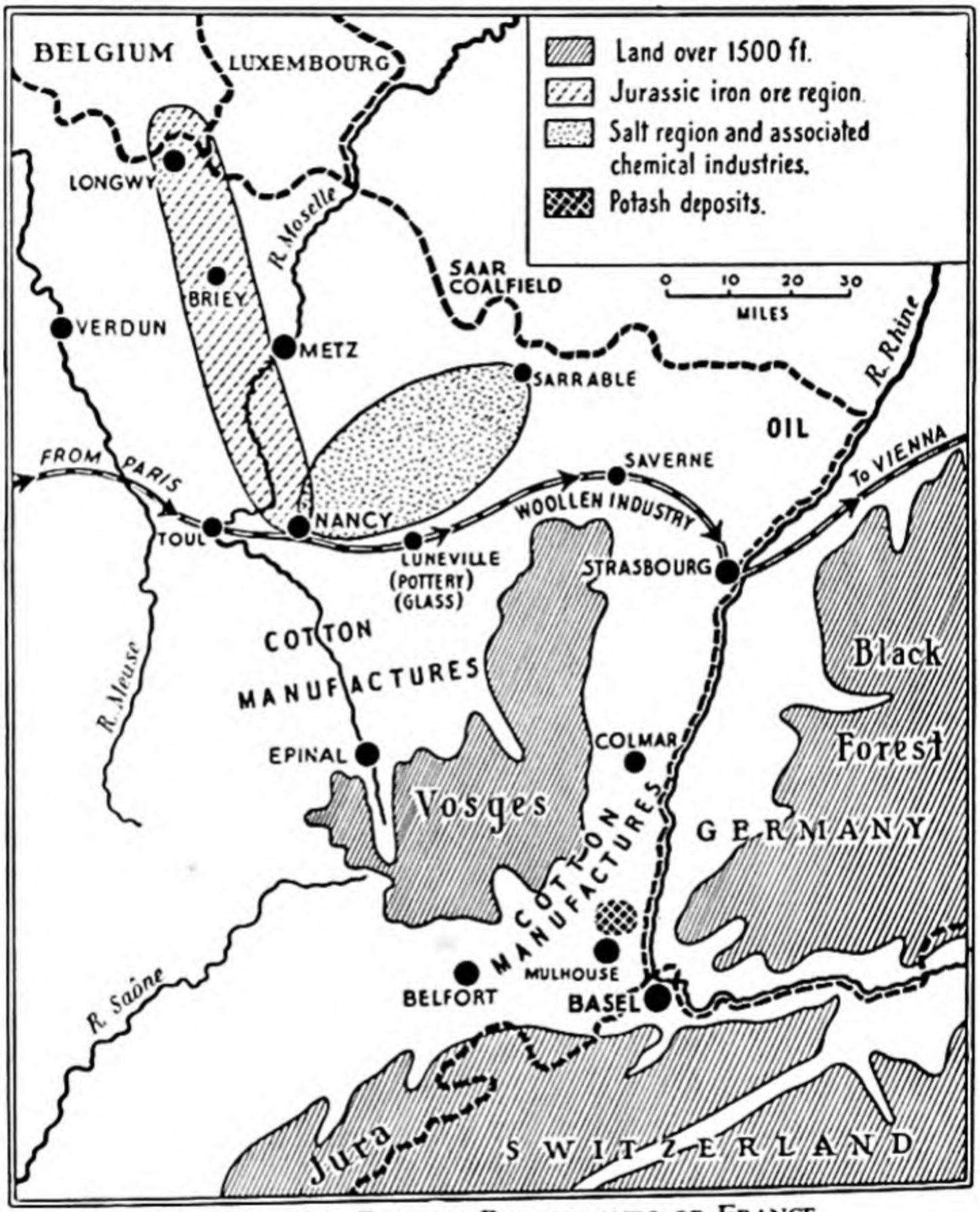


Fig. 31. THE EASTERN BORDERLANDS OF FRANCE.

to those of the Jurassic scarplands of England, and could not be utilised until modern methods of smelting were perfected. The iron ore is mined chiefly in the neighbourhood of Longwy, and there are large iron works at Nancy and Metz. It is now

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proposed to canalise the Moselle from Thionville in Lorraine to Coblenz and this will reduce the cost of transport of coal and iron ore between Lorraine and the Ruhr.

In the New Red Sandstones east of the River Moselle are large deposits of salt (cf. the salt deposits of Cheshire), which have given rise to chemical manufactures and glass-making. North of Mulhouse there are very important potash deposits (see Fig. 55). Around the south and east end of the Vosges Mountains are several towns engaged in the textile industry, principally the manufacture of cotton goods. The chief centres are at Mulhouse, Colmar and Belfort.

Two great natural routes pass through Eastern France—

(1) The route between the Vosges Mountains and the Jura Mountains (the Burgundian Gate), which gives easy access between the Rhone, Saône and Rhine valleys, and is followed by the Burgundy Canal.

(2) The route around the north of the Vosges via the Saverne Gate. This route from Paris to Strasbourg is part of the Orient Express route (see Fig. 22).

Strasbourg (200,000), where the River Ill joins the Rhine, is the centre of the Rhine Rift valley. It controls routes: (*a*) westwards to Paris via the Saverne Gate; (*b*) northwards down the Rhine and via Frankfurt to Central Germany; (*c*) eastwards along the northern end of the Black Forest to Eastern Europe; and (*d*) southwards up the Rhine valley to Switzerland and the Mediterranean, via the Burgundy Gate and Rhone valley. River steamers can navigate the Rhine as far as Strasbourg, hence it is an important river port. Four large refineries are being built around Strasbourg to handle French Saharan oil brought by pipe-line from Marseilles.

The Rhone-Saône Basin

From Lake Geneva westward, the Rhone (Fig. 32) flows through mountainous country to Lyons, where it turns abruptly south and is joined by the River Saône. The combined valley of the Rhone-Saône forms a long north to south valley, usually known as the Rhone "corridor," which has been, throughout historical time, the chief highway from the Mediterranean to Northern Europe. It provides natural

routes via Dijon to Paris and Britain, and via the Burgundy Gate to the Rhine and Northern Germany.

Owing to navigational difficulties, the Rhone is not much used by shipping, except for petroleum from refineries near Marseilles. A very large-scale hydro-electric project in hand involves the building of twenty power-stations, to supply one-third of France's present requirements of electricity, and of canals to by-pass difficult stretches of river. The first of these power-stations at Donzère, north of Avignon, and a canal of nineteen miles, were opened in 1952.

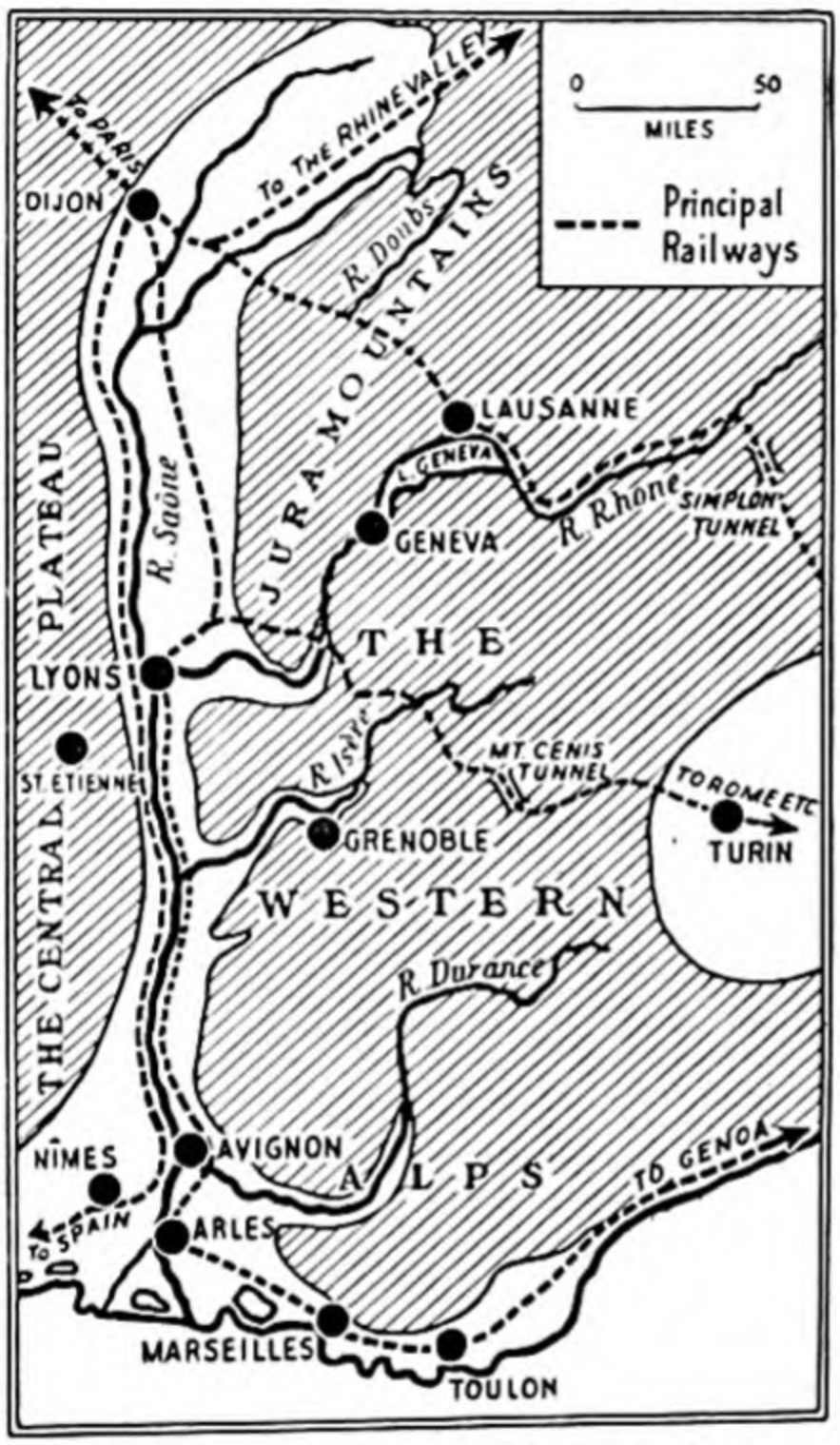


Fig. 32. THE BASIN OF THE RHONE, SHOWING PRINCIPAL ROUTES AND TOWNS.

The Saône valley north of Lyons has a somewhat "continental" climate, with extreme temperatures and some rain in summer.

South of Lyons the summer rain disappears, and the climate becomes Mediterranean in type. Because of the summer rainfall, the pastures of the Saône valley are richer than those further south, and the rearing of cattle is important. Wheat and vine are the chief crops. The south-facing slopes of the Côte d'Or are terraced with vineyards, and this is one of the important wine areas noted for the making of Burgundy.

Dijon (112,000), at the convergence of routes from Paris, the Rhine lands, Switzerland and Marseilles, is a very important railway junction.

To the east of the Saône valley are the Jura Mountains. These mountains are formed of parallel limestone ridges which make west to east communication difficult except where there are narrow transverse valleys. The railway from Dijon to Switzerland follows a zigzag route across these ridges via Pontarlier.

Lyons (550,000), at the confluence of the Rhone and Saône, is the third town of France, and a great industrial centre engaged primarily in silk manufacture. This is due to the extensive cultivation of mulberry trees, and the attendant silk-worm industry in the Rhone valley south of Lyons. The coal supplies are obtained from the St. Etienne coalfield to the south-west. South of Lyons the Rhone valley narrows as far as Montélimar, where it opens out into the Mediterranean coastlands. The valley sides are terraced for the cultivation of vines and mulberries. To the east of the Rhone valley are the Western Alps, drained by two large tributaries of the Rhone, viz. the Isère and Durance. The valleys are cultivated, but the mountain slopes are either forested or used for the pasturing of sheep and goats. The swift-flowing streams are an important source of hydro-electric power. There is one important route across the Western Alps between France and Italy, and that is the route from Lyons to Turin, which crosses the watershed by a tunnel just south of the Mont Cenis Pass.

Grenoble (116,000) is the chief city of the Western Alps. It is situated on the Isère, and is famous for the manufacture of gloves and for its university.

The Mediterranean Coastlands

The Mediterranean coastlands include the triangular low-land of the lower Rhone and the narrow plains extending eastward and westward along the coast. West of Marseilles the plain is alluvial, and includes the large delta of the Rhone. The whole region is liable to destructive floods, partly as a result of deforestation, and partly because the rivers (with the exception of the Rhone) are short streams, liable to sudden

increases in volume due to the heavy rains and the melting of the snow in spring on the plateau to the north. Climatically the region is of the Mediterranean type, with hot summers and mild winters, during which the bulk of the rain falls. Irrigation is necessary, and pastures, because of the hot and relatively dry summers, are much poorer than in other parts of France. The products are those typical of Mediterranean areas, viz. olives, vines and mulberries. West of the Rhone agriculture is almost entirely limited to vine-growing, a fact which, in years of poor harvests, causes great poverty and hardship. East of the Rhone, olives, mulberries, early vegetables, flowers and some oranges are grown in addition to vines, so that it is a region of greater prosperity. The salty pastures of the delta are used for feeding Alpine sheep during the winter months and rice is grown under irrigation.

East of Marseilles the coastal plain is narrow and backed by high and picturesque mountains. This region is known as the Côte d'Azur, and, because of its scenery, its intensely blue sea, and sunny skies, is a famous holiday region with such well-known resorts as Nice (250,000), Antibes, Cannes, etc. A few miles inland, in a sheltered valley, is Grasse, famous for the cultivation of flowers and the distillation of their essence for the manufacture of scent.

Marseilles (660,000), situated thirty miles east of the Rhone mouth and linked to the main river at Arles by a canal, is the first port and second city of France. Here a sea current flows from east to west, so that the silt brought down by the Rhone is carried away from the harbour. Its great importance, both in the days of the Greek and Roman Empires and in modern times, is primarily due to its position at the entrance to the Rhone corridor. The opening of the Suez Canal, and the development of the great sea route to the East, added greatly to the importance of this port. Moreover, it is the port through which France has direct access to her North African colonies. Like many other ports, its industries are based on its imports of raw materials, and Marseilles is important for flour-milling, sugar refining, oil refining, the tanning of leather, etc. But its most important group of industries are those connected with, and dependent on, vegetable oils. These industries, originally based on the local supplies of olive oil,

now include the manufacture of candles, margarine, soap and toilet requisites. They involve the use and importation of such products as palm oil, copra, ground nuts, soya beans, cotton seed, linseed, etc., so that Marseilles is the greatest centre in the world for the importation of vegetable oils and oil seeds.

Toulon, to the east of Marseilles, and situated on a fine natural harbour, is the French Mediterranean naval station.

In the lower Rhone region are a number of towns of great historical interest such as Arles, Avignon and Nimes, the latter being famous for its great Roman aqueduct.

Corsica

This is a mountainous island about the size of Wales. More than half the island is covered with a dense growth of shrubs and scrub, known as maquis or macchia. The people of the highlands are principally engaged in the rearing of sheep and goats. On the fertile alluvial coastal plain, grain, vines, olives and chestnuts are grown. The capital is Ajaccio, but Bastia (40,000) is the largest town and the chief port.

France as an Agricultural Country

If the map of the distribution of population for France (see Fig. 23) is studied, two points are clear, viz.: (1) that there are far fewer areas of dense population in France than in England; (2) that over most of France the density of population is similar to that of the mainly agricultural counties of England, viz. Cornwall, Devon, Wiltshire, etc. Furthermore, the average density of population for England and Wales is 790 people per square mile, while that of France's 45 million people is 214 per square mile.

The difference in the densities of population of the two countries is primarily because in France agricultural pursuits are more important than industry, while in England the reverse condition holds. In France about 25 per cent. of the population is engaged in some form of agriculture and 27 per cent. in industry, while in Great Britain under 5 per cent. is engaged in agriculture and over 50 per cent. in industry. From this it may be seen that France is primarily an agricultural country, and this is due to:—

(1) The large percentage (nearly 80 per cent.) of productive lands.

(2) The favourable climatic conditions of humidity and temperature.

(3) The absence of extensive coalfields to encourage industrial development and rural depopulation.

(4) The great variety of crops which can be cultivated, ranging from the grains, roots and fruits of the cool temperate zone to the olive, mulberry and vine of the warmer latitudes.

(5) The high esteem in which land ownership is held by the French people, the love of the French peasant for his acres,

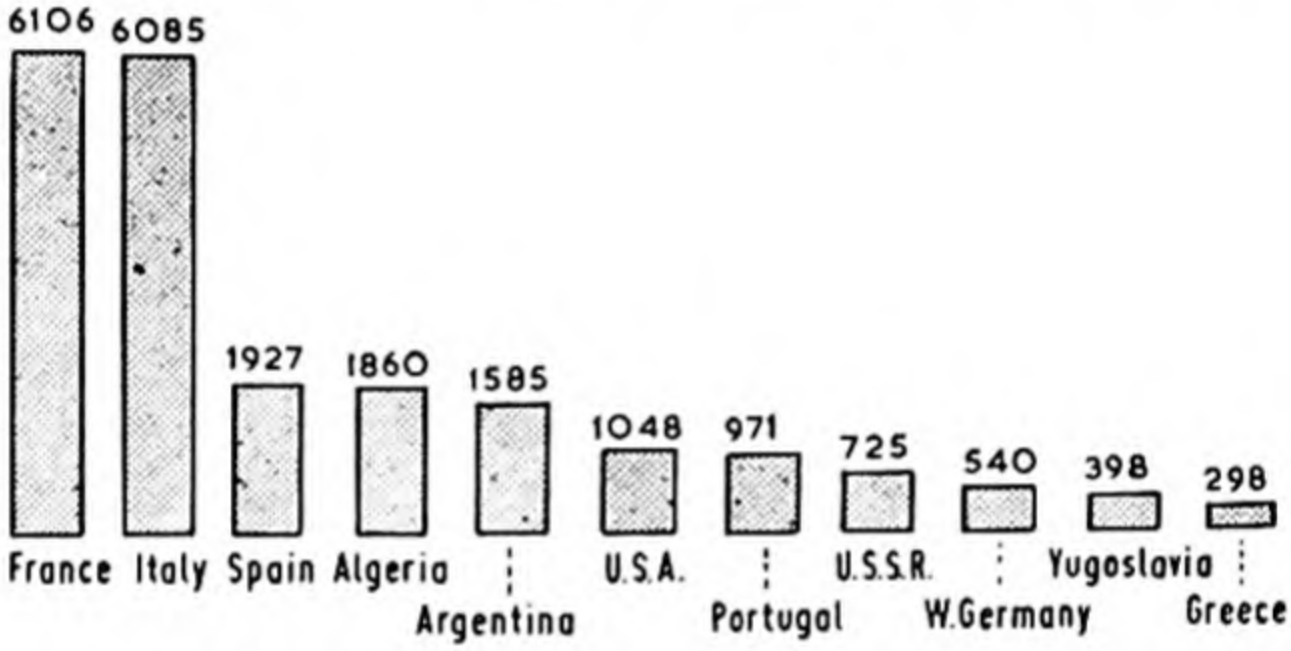


Fig. 33. Annual Production of Wine, 1959-60 (in Thousands of Tons).

and his reluctance to depart from his inherited lands and from the mode of living which his ancestors have practised for centuries. Because of the subdivision of farms owing to the French laws of inheritance, most of the French farms are extremely small (under 25 acres), but they are efficiently and carefully cultivated. France has more than half as many cattle again as the United Kingdom, mainly near the Channel coast, and comes fifth among world producers of beef. By far the most important crops of France are wheat and vine.

Wheat.—France ranks as the fifth producer of wheat in the world, and in normal years has some to export. Nearly one-eighth of France is wheat-growing; the chief regions are the Paris Basin and Aquitaine.

VINE CULTURE.—France is the most important wine producer in the world, though Italy has a greater acreage of vineyards (Fig. 33). Wine is the national beverage of France. Most of the wines are light, and many of them do not bear special names, but are commonly known as "vin ordinaire."

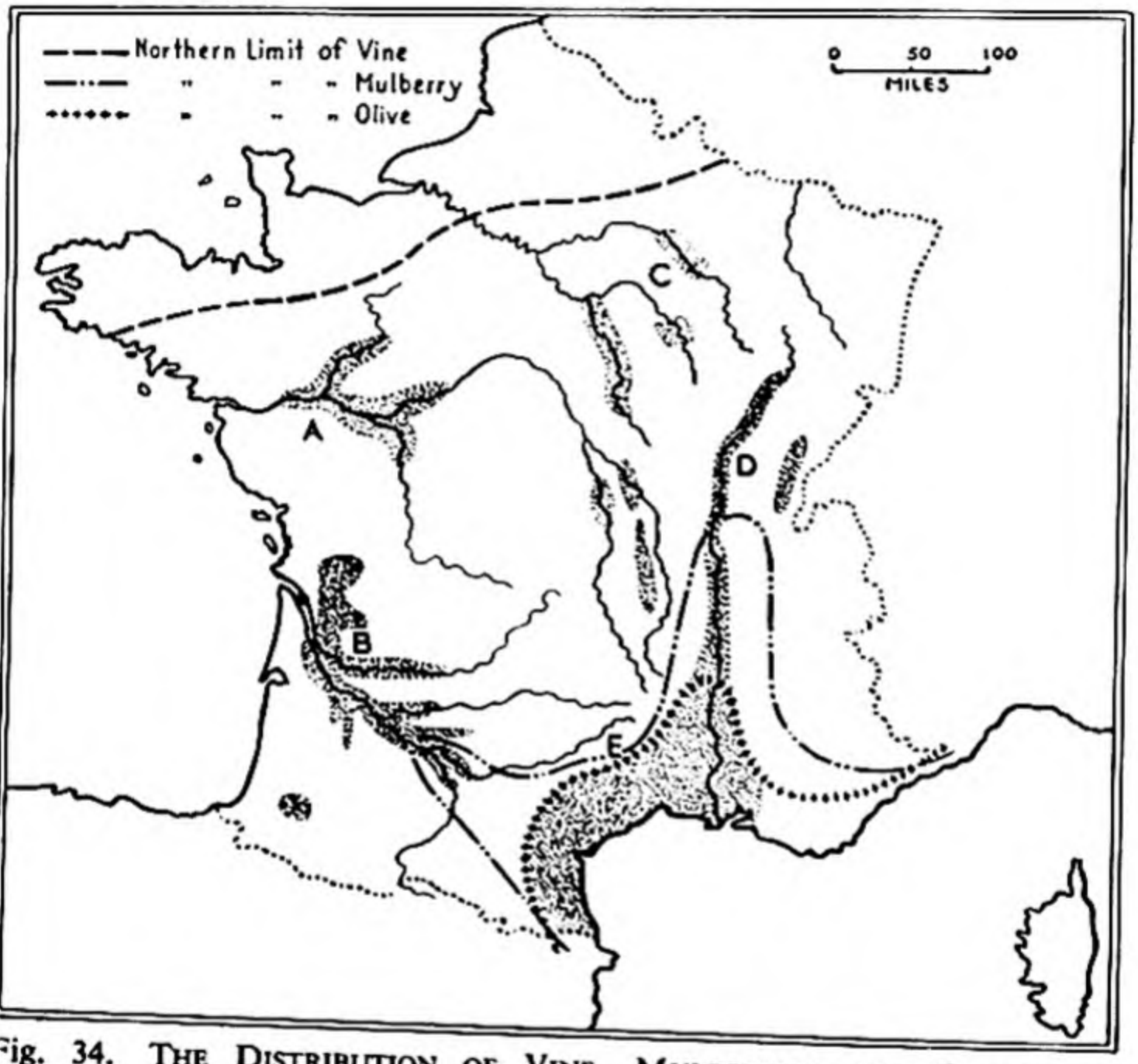


Fig. 34. THE DISTRIBUTION OF VINE, MULBERRIES AND OLIVES IN FRANCE.—A, Loire Basin; B, Charente, Dordogne; C, Champagne; D, Côte d'Or; E, Languedoc. Chief vine regions shaded.

Because the summers of Northern France are too cool, the vine is not cultivated north of a line running from the mouth of the River Loire to Paris (Fig. 34). It will be noted that in Eastern France the vine can be cultivated further north than in Western France. This is because the summer temperature increases eastward away from oceanic influences. South of this line the vine is cultivated everywhere except on

the barren uplands, but five districts are of special importance—

(A) The lower Loire valley. (B) The lowlands of the Charente and Garonne valleys, noted for brandy and clarets. (C) The Champagne region of the chalk escarpments east of Paris. (D) The south-facing slopes of the Côte d'Or, noted especially for burgundy. (E) The south-facing slopes of the Central Plateau and the plains of Languedoc—where over 50 per cent. of the wine is made.

Both production and export of French wines has declined in recent years and her imports of cheaper Algerian wine now cost France more than she receives for her own wine exports.

The Trade of France

Situated athwart Western Europe between the English Channel and the Mediterranean Sea, France has an excellent situation for the development of overseas trade. In total value of trade France comes fifth, immediately after Canada, but this total is only about one-half that of the United Kingdom and about a third that of the United States. The great development of agriculture and the variety of agricultural products makes her independent of foreign supplies of, *e.g.*, wheat, meat, etc. Because her industrial development is not so great as that of Britain, France needs less imported raw materials and has fewer manufactured goods to export.

Apart from food, the chief imports of France are coal, vegetable oils, crude petroleum (refined at Havre, Rouen, Dunkirk and Marseilles), wool, cotton, silk, machinery and coffee. Her exports are principally chemicals, iron and steel goods, machinery (including motor-cars), textiles and a whole range of luxury commodities. Within the last few years France has also become an exporter of beef, competing with Denmark for the German market.

French trade is mainly with the U.S.A. and the neighbouring European countries of Western Germany, Belgium, the United Kingdom, Switzerland and Italy, and with Algeria, the former French West Africa and the former French possessions of Tunisia and Morocco.

CHAPTER IV

THE COUNTRIES OF THE NORTH-WESTERN MARGINS OF EUROPE: (2) BELGIUM AND HOLLAND

A Comparison

Belgium and Holland are two small countries, situated at the narrowest part of the European plain and opposite to the Thames estuary.

The following figures show the similarity of their size and population—

	Size in Square Miles	Population	No. of People per Square Mile
Belgium	11,775	9,100,000	774
Holland	13,514	11,260,000	833

The two countries are nearly the same in area, their populations are not very different, and both are extremely densely populated. Holland, indeed, has the highest population density of any country in the world, with England and Wales second, and Belgium third.

In both countries a highly-intensive form of agriculture is practised; in Belgium 60 per cent. of the land is under cultivation, and in Holland 75 per cent. Farms tend to be small; most of those in Holland are under 25 acres. Belgium, because of her greater percentage of highland (the Ardennes), has a larger percentage of unproductive land. The principal crops of the two countries in order of production are—

Belgium		Holland	
Sugar-beet	Wheat	Oats	Flax
Potatoes	Barley	Rye	Sugar-beet
Oats	Tobacco	Wheat	Potatoes
Rye	Flax	Barley	

The yield per acre for all these crops is high in both countries. For some crops, such as potatoes, oats, and barley, Belgium has a higher yield per acre than any other country. This is due to the diligent and careful methods of cultivation, Belgium and Holland using more fertilisers per acre than any other country. Many of the crops are the basis of flourishing industries. The sugar-beet gives rise to sugar factories, of which there are 51 in Belgium and 14 in Holland. Potatoes are used for the distillation of alcohol, and rye for the distillation of gin; there being 21 distilleries in Belgium and 278 in Holland. Home-grown flax is the basis of the important linen industries in both countries. Both countries have a large number of horses, cattle, and pigs per square mile. Holland has more cattle per square mile than any other country in the world, and more horses and pigs per square mile than any other country except Denmark.

Intensive agriculture alone is not responsible for the phenomenal density of population of these two small countries, but, with regard to occupations other than agriculture, the two countries differ very greatly. Belgium has large coalfields, and originally had good supplies of iron and zinc ores. Hence, in addition to agriculture, Belgium is highly developed industrially, and is famous for both textile and engineering industries. Holland, on the other hand, without her own supplies of coal, until the discovery of the deep-seated coal seams of southern Holland (Limburg) during the War of 1914-18, developed as a great commercial country, ranking sixth among the nations in respect of gross tonnage of shipping and fifth for shipbuilding. Nevertheless, industrial development has been rapid in recent years, and Holland now has twice as many people engaged in industry as in agriculture, although some of these industries, of course, are based on agricultural products. Her industries are those which

(1) require little raw material or fuel but much skill, *e.g.* diamond cutting,

(2) are the direct outcome of agriculture, *e.g.* the manufacture of butter and cheese,

(3) are based on imports from her former colonies, *e.g.* chocolate and tobacco manufacture, the smelting of tin and other ores, or,

(4) are based on modern scientific discoveries—electrical apparatus and wireless sets, rubber, rayon, fertilisers, chemicals, drugs, and petroleum refining.

Both countries had an early start, for the Belgian textile industry dates back to the Flemish woollen and linen industries of the Middle Ages, while Holland's commercial importance can be traced to the sixteenth century, when she distributed the produce brought via Lisbon from the East by the Portuguese. The position of Holland at the mouth of the Rhine, giving easy access to Central Europe, has also been a strong factor in the development of her trade. Holland, with a long coastline, has developed an important fishing industry, an occupation almost completely neglected by Belgium, whose sandy coastline is straight and lacks good harbours.

To sum up, the density of population of Holland and Belgium may be attributed to—

(1) The small percentage of unproductive land.

(2) The favourable climate.

(3) The intensive agriculture and its attendant industries.

(4) The industrial development and, in the case of Holland, commercial development as well.

BELGIUM

Belgium falls into four regional units (Fig. 35)—

(1) The coastal lands.

(2) The central plains.

(3) The southern highlands.

(4) The coalfield zone, which is a relatively narrow strip of country extending west to east between divisions (2) and (3).

The Coastal Lands

The coast of Belgium is about 40 miles long and is very straight, consisting of a ridge of sand dunes rising about 20 to 30 feet above the level of the plains behind (see plate facing page 49). The chief ports are Nieuport, at the mouth of the River Yser, and Ostend and Zeebrugge, both of which are connected to Bruges and Ghent by canal. The sandy shores have caused the growth of a number of well-known seaside resorts, such as Blankenberghe and Ostend.

Immediately behind the dunes is a region of low-lying reclaimed marshland, usually referred to as "polder" land. It is about ten miles wide, and is crossed by a network of drainage canals, the scenery being reminiscent of Holland. The flooding of the low-lying lands in the Yser basin stemmed the German advance towards Calais in 1914 and helped to cover the British evacuation from Dunkirk in 1940. The polders are a rich agricultural region, producing large crops of wheat, barley and

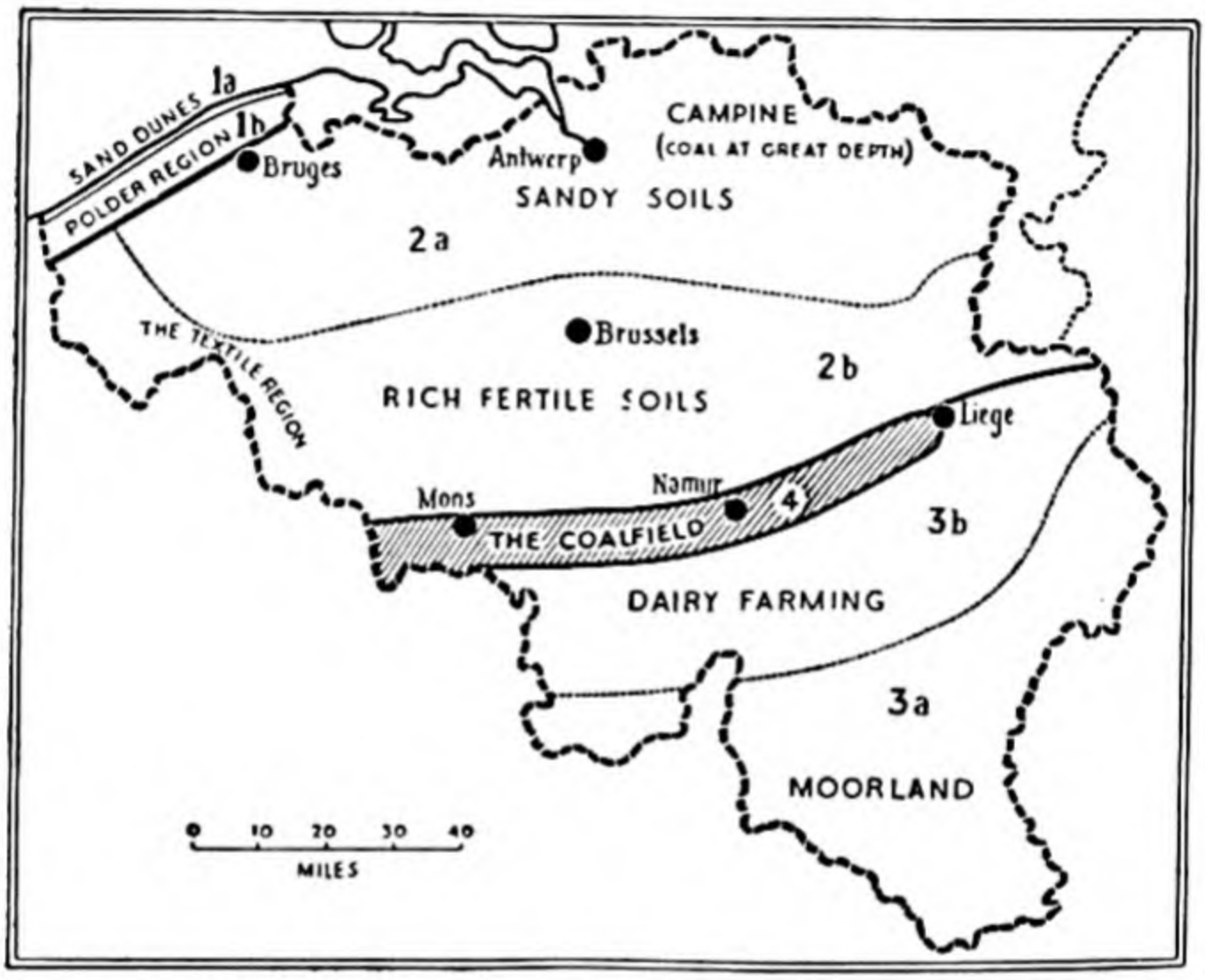


Fig. 35. BELGIUM. NATURAL DIVISIONS.—This map should be compared carefully with Fig. 36.

sugar-beet. There are also rich pastures devoted to cattle-rearing.

The Central Plains

This region includes the Basin of the Scheldt and the region known as the Campine near the Dutch frontier. The Campine is a region of poor sandy soil where agriculture is difficult, for it consists largely of heathland. Coal has been discovered at a great depth, and mining centres are growing, so that the region may have an important industrial future.

The Scheldt Basin occupies Central Belgium (Fig. 36). The Scheldt itself rises in France, and its tributaries the Lys, Dendre, Senne, Dyle and Demer flow to it fanwise, so that their valley routes converge on Antwerp at the mouth of the main river. This is the great agricultural region of Belgium, and the chief region for grain and sugar-beet. Flax is grown mainly in the west of the basin in the Lys valley and near Ypres. Market gardening, and in particular the growth of greenhouse grapes for export, is important around Brussels.

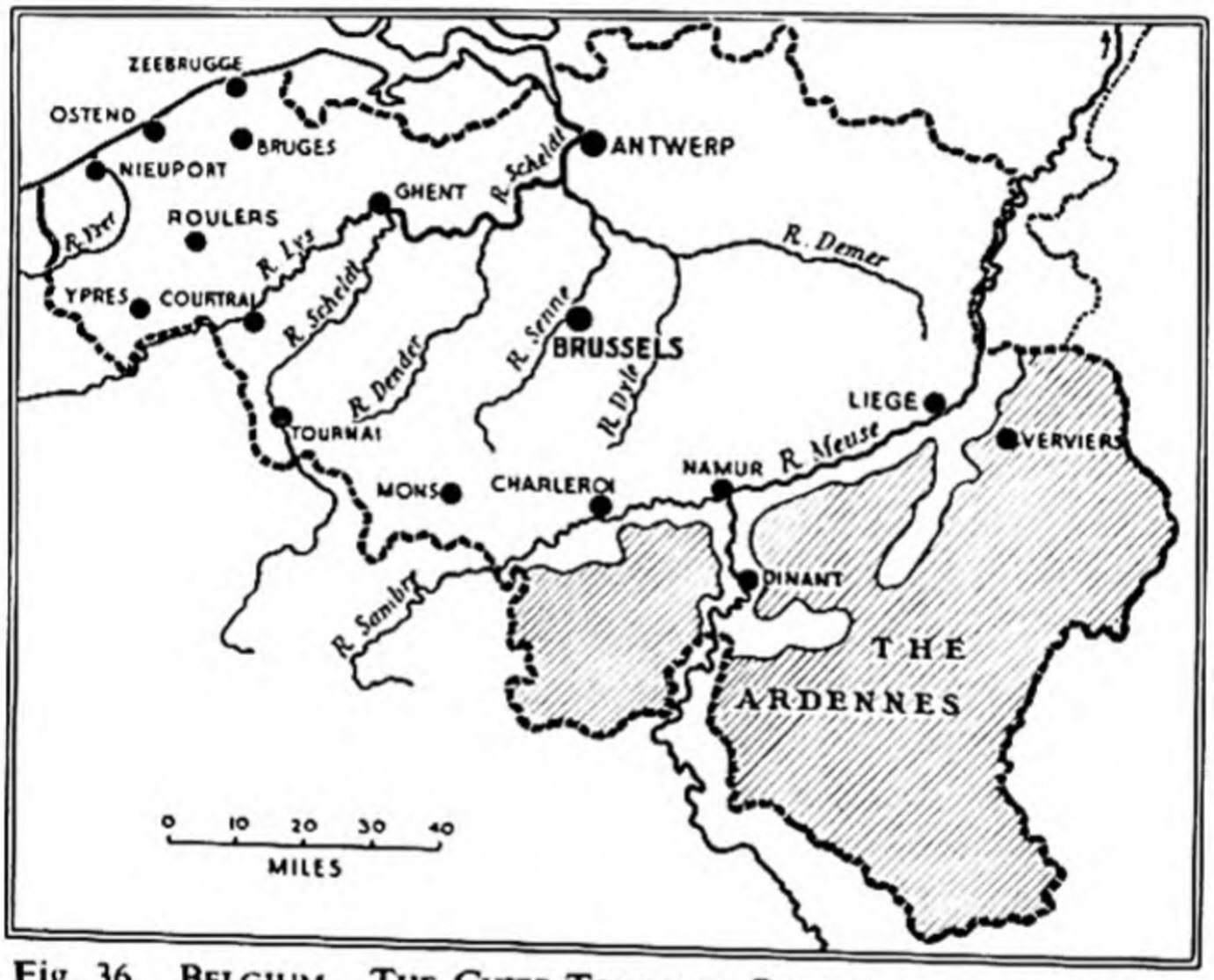


Fig. 36. BELGIUM. THE CHIEF TOWNS IN RELATION TO THE RIVERS AND HIGHLAND.

It is in this region that most of the industries based on agriculture are located, viz. sugar refining, brewing, distillation of alcohol, and the manufacture of margarine and vinegar. In the west of the basin in the valley of the River Lys is the great linen manufacturing region, the chief towns being Ghent, Courtrai, Roulers and Tournai. The growth of this industry has been due to—

(1) The inherited skill in spinning and weaving, which dates back to the Flemish woollen industries of the Middle Ages.

(2) The local supplies of flax.

(3) The suitability of the waters of the River Lys for retting.

(4) The supplies of coal from the Belgian coalfield.

Brussels (1,000,000), the capital on the River Senne, occupies a central position in Belgium. It stands half-way between the coalfield and the sea, and is nearly the geometric centre of the Scheldt Basin. It is connected by canal with Antwerp, so that it has some importance as a port. Its industries are of the luxury type usually connected with a "capital" city, viz. the manufacture of furniture, paper, and luxury articles.

Antwerp (630,000), at the mouth of the Scheldt, is not only the great port of Belgium, but, measured by the tonnage of shipping which enters the port annually, is one of the greatest ports in the world, competing with New York, London and Rotterdam for first place. For instance, in 1926-28 the total tonnage of shipping entering and leaving Antwerp actually surpassed that of every other port in the world. The importance of Antwerp is not merely due to the import and export trade of Belgium. It has, in addition, a large "transit" trade, *i.e.* goods are imported at Antwerp for dispatch to other European countries, especially Germany, and goods from other countries are exported via Antwerp. The hinterland of Antwerp extends far beyond the limits of Belgium and includes part of Eastern France, the Rhine Valley, and the Ruhr coalfield.

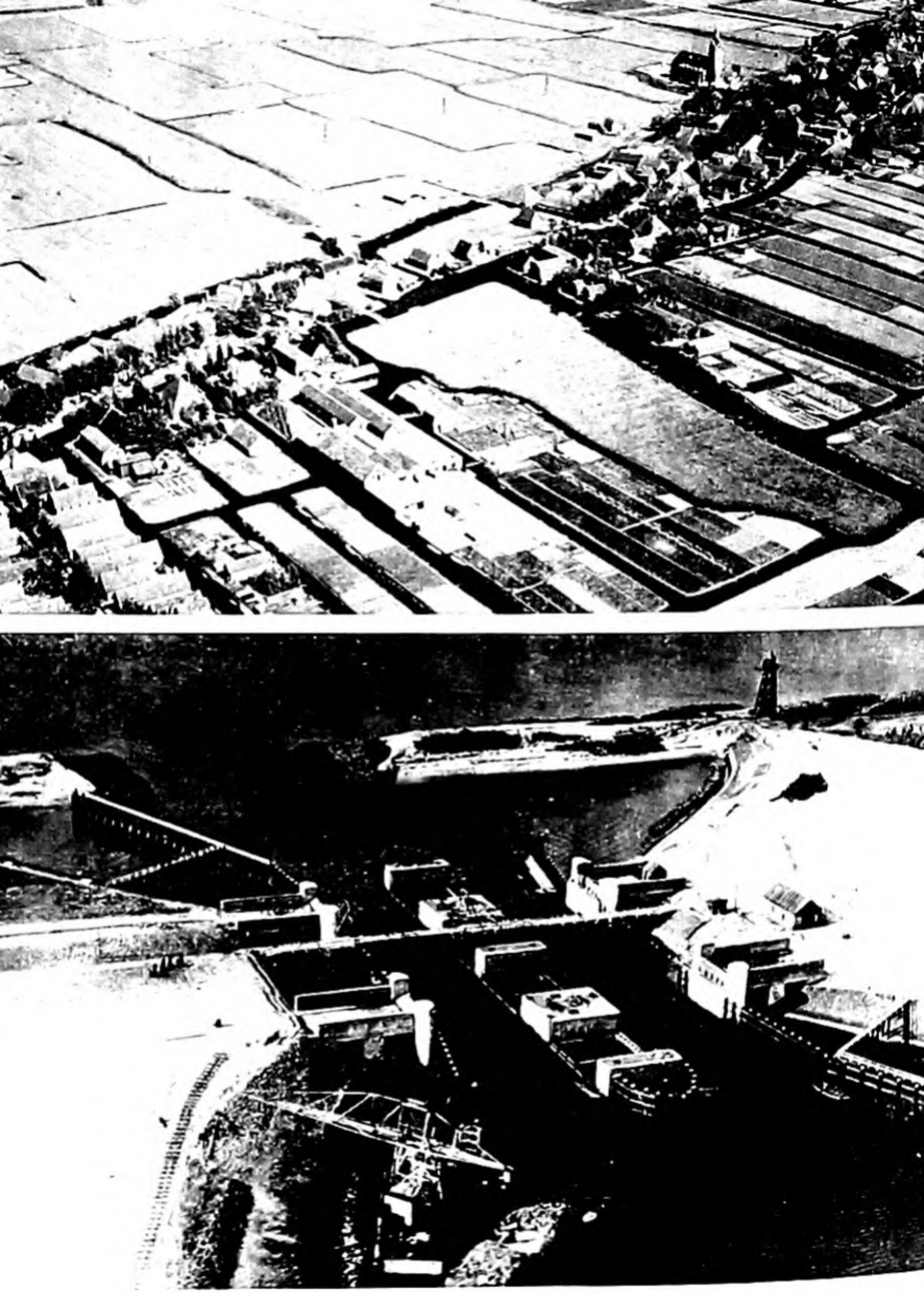
Ypres, Bruges and Ghent (225,000) are old towns famous for their woollen manufactures since the Middle Ages.

The Southern Highlands

South of the basin of the Scheldt is the west to east valley of the Meuse and its tributary the Sambre. South of the Sambre-Meuse valley rises the highland area of Belgium. This is the Ardennes, structurally a region of old rock rising to over 2,000 feet and part of an ancient mountain system (see plate facing this page). It is drained by a section of the Meuse and its tributaries. The higher districts to the south are partly forested and partly open moorland used as sheep pastures, but the northern half of the upland region is a flourishing agricultural area, and is specially important for dairy farming, due to the need of the towns of the coalfield for supplies of milk and dairy produce. The Meuse valley is very picturesque and contains a number of well-known tourist centres, *e.g.* Dinant.

ove The valley of the Semois, a tributary of the Meuse. The Ardennes country of uthern Belgium, with its rolling wooded hills and fertile valleys, offers a strong contrast to the flat plains of Northern Belgium. (*Degroote, Belgian State Tourist Office.*)

low The Rhine-Maas Delta. Note the low, flat, sandy islands, dissected by numerous all creeks, and separated by the large distributaries of the river. (*K.L.M. Royal Dutch Air Lines.*)



Above: A Dutch Village in the polders. (*K.L.M. Royal Dutch Air Lines.*)

Below: Locks under construction. A large part of Holland is below sea level, and the reclaiming of new land and the protection of existing polders demands vast engineering works and ceaseless vigilance. (*Royal Netherlands Embassy.*)

Verviers, near the German frontier, specialises in the cleaning of wool, mainly imported. Formerly it had a woollen industry which owed its origin to the wool supplies from the Ardennes and to the proximity of coal supplies.

The Belgian Coalfield

The coalfield extends from Northern France (see Fig. 29) through Mons and Charleroi to Namur, following the line of the Sambre valley. The coalfield also extends farther east along the Meuse valley to Liège. The chief mining centres are around Mons and Charleroi (280,000). Output is falling and is now about 22 million tons. The workable seams are now deep-seated, thin and irregular, and mining operations are becoming more difficult. The deposits of zinc ore and iron ore are almost exhausted, but fortunately the iron ore deposits of Lorraine and Luxemburg are within easy reach.

Metal industries are the basis of the principal activities of the coalfield, and include the smelting and manufacture of iron, zinc, copper and tin. The chief engineering and metal working centres are Charleroi and Liège (450,000). Chemicals and glass are also manufactured.

The Sambre-Meuse valley is a natural highway between Germany and France, and this, coupled with its industrial development, makes the area the most densely populated in Belgium.

Language and Peoples

Belgium is essentially a transition country between Germany and Holland on one hand and France on the other.

The people of Northern Belgium (*i.e.* the north of a line from Liège through Brussels to Courtrai) are often a fair-haired, blue-eyed type akin to the peoples of Northern Europe (Nordic type, see page 34). They speak Flemish, a language similar to Dutch. In Southern Belgium the people are generally of a darker type and speak Walloon, a language similar to French. The Flemish are not only careful agriculturists, but throughout history have been skilled craftsmen and had a strong sense of civic pride, founding such cities as Ypres and Bruges with their fine public buildings. The Walloons, like their French neighbours, are strongly attached to the land, and the great cities of Southern Belgium are usually of more recent growth than those of the north.

LUXEMBURG

Luxemburg, a small independent State about the size of Cheshire, with a population of 300,000, is situated between Belgium, France and Germany. To foster trade, a Customs Union has been agreed upon with Belgium and the Netherlands.

Luxemburg is largely devoted to agriculture, but also has valuable iron deposits which are a continuation of the Lorraine iron deposits of Eastern France (see Fig. 31).

HOLLAND

Holland is the deltaic area of the Rivers Rhine, Meuse and Scheldt. Consequently it is a low-lying country and its highest point, in the extreme south-east of the Limburg "pan-handle," is under 350 feet above sea-level. The main drainage of the country consists of a complicated series of distributaries of the Rhine and Meuse, the chief of which are the River Waal and the River Lek, which flow westward. Another large distributary, the River Yssel, flows northward to the Zuyder Zee (see plate facing page 64).

Climatically Holland is very similar to Eastern England, the main difference being in the greater coldness of the Dutch winters. The similarities and differences are shown by a comparison of the climatic data for London and Utrecht.

	July Temp.	Jan. Temp.	Winter Rainfall	Summer Rainfall	Total Rainfall
London	63° F. (*17° C.*)	39° F. (*4° C.*)	12″	13″	25″
Utrecht	63° F. (*17° C.*)	35° F. (*2° C.*)	13″	14″	27″

In spite of the absence of positive relief features and strong climatic contrasts, Holland may be divided into three well-defined regions (Fig. 37)—

(A) The coastal belt.

(B) Central Holland, *i.e.* the polder land which is mostly below sea-level.

(C) Eastern Holland, *i.e.* three separate areas of land above sea-level lying generally to the east of the polders.

The Coastal Belt

The coast of Holland is composed of sand dunes, which also border the seaward edges of the islands of Zeeland and the west Frisian Islands. Between these two groups of islands is a smooth unbroken coastline extending from the Hook to Helder.

The dunes are strengthened and reinforced to prevent the sea encroaching on the low-lying polders behind the dunes.

Fig. 37. HOLLAND. NATURAL DIVISIONS AND CHIEF TOWNS AND SCHOONBEEK OILFIELD.

The "Polder" Country or Central Holland

About 40 per cent. of Holland consists of polder land (see plate facing page 65) and two-thirds of this area is below the level of high tide, often by as much as 25 feet. Polder land is reclaimed land surrounded by dykes. In the fourth century large areas of Holland were inundated. The lagoons (*e.g.* Haarlem Meer) and salt marshes thus formed have been drained and converted into valuable agricultural land. Dykes were constructed around these low-lying areas, and the water pumped into high-level canals and so drained to the sea. The maintenance of these dykes and the control of the dunes is one of the most important responsibilities of the Dutch Government. At the present time a great scheme is in progress for the reclamation of part of the Zuyder Zee. By this scheme over 800 square miles of polders (*i.e.* one-sixteenth of the total area of Holland) will become available for agricultural development. Work was begun in 1920, and will probably take another 25 to 30 years to complete. Details of the scheme are shown on Fig. 38. The dam across the northern end of the Zuyder Zee has already been completed and the north-west, north-east and part of the east polders drained and cultivated. Lake Yssel will gradually become a fresh-water lake, and will probably be important for fresh-water fisheries.

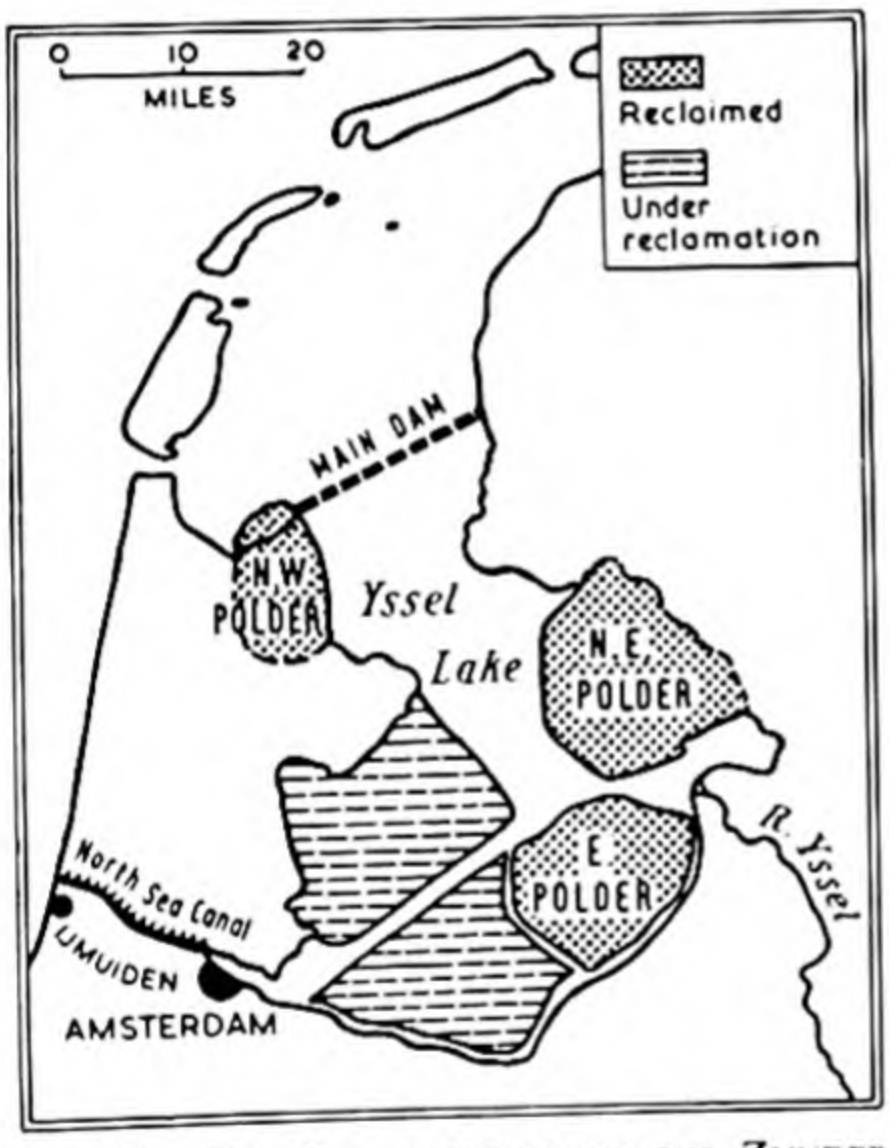


Fig. 38. THE RECLAMATION OF THE ZUYDER ZEE.

The polders constitute the richest agricultural regions of Holland because of the fertility of the alluvial soils, and they may be divided into three distinct regions—

(1) In the south is the "island" region of Zeeland. Here cattle and horses are reared on rich pasture lands and a variety of crops is grown, viz. wheat, oats, potatoes, flax, and sugar-beet, etc. In this region the people are closely in contact with the sea, and thus it may be considered the nursery of the Dutch fishing industry, and of Dutch maritime and commercial activity.

(2) A second large area of polder lies in the north-east of Holland, in the province of Groningen. Because of its less indented coastline it lacks the maritime associations of Zeeland, and is more exclusively devoted to farming. It is a region of rich pasture lands, and produces large quantities of milk, butter and cheese. Holland ranks high as an exporter of cheese and condensed milk, but does not export butter to the same extent as Denmark.

(3) Between regions (1) and (2) lie the central polders. Agriculturally this is the richest region of all, for the mixing of the sandy soils of the dunes with the heavier soils of the polders has produced a soil of exceptional fertility. Here, as elsewhere, dairy farming and the cultivation of wheat, sugar-beet and flax, etc., are important, but in the neighbourhood of Leyden and Haarlem bulbs are intensively cultivated and flowers and vegetables grown for their seed. Market gardening and the cultivation of early strawberries and potatoes are also important. Holland exports nearly a quarter of a million tons of fresh vegetables a year.

The principal cities of Holland lie in the polder zone. Many of them are associated with industries based on agricultural products, viz. the distilling of gin, the manufacture of linen (brown Holland), the refining of sugar, brewing, and the making of cheese. Some, notably Rotterdam and Amsterdam, have industries based on imported raw materials, *e.g.* diamond cutting (Amsterdam), the manufacture of cocoa and chocolate, the manufacture of cigarettes and cigars, the manufacture of margarine. Margarine was originally made from animal fat, but the industry now depends on imported supplies of vegetable oils, *e.g.* palm-kernel oil, ground nut oil, etc. Other towns owe their importance to their maritime position. Thus Ijmuiden is an important fishing port and has large steelworks using imported ore. Flushing, on the Island of Walcheren,

and the Hook of Holland are packet stations from which steamers sail to Britain (Harwich and Hull).

Amsterdam (850,000), on the west side of the Zuyder Zee, is the capital. The ships of olden days could navigate the shallow Zuyder Zee, but to-day Amsterdam is linked with the North Sea at Ijmuiden by the North Sea Canal, capable of taking the very largest vessels. During the "Period of Discovery" it was the great entrepôt (or depôt for distribution and collection of produce) for Northern Europe and had a great trade in Oriental produce. Even to this day the trade of Amsterdam is primarily concerned with the produce of the East Indies, viz. rubber, cocoa, tin, rice, spices, tobacco, copra, etc. Aircraft, ships, and chemicals are also manufactured. Amsterdam is joined to the Rhine by a canal, enlarged in 1952 to take the largest Rhine barges, and has developed a considerable transport trade with Rhine lands.

Rotterdam (750,000), on a distributary of the Rhine, the New Maas, is to-day connected with the sea at the Hook of Holland by a deep canal known as the New Waterway. Although Rotterdam is smaller than Amsterdam, it is the greater port and handles about three-quarters of Dutch trade. Rotterdam, however, is not only a port concerned with the importation of food and raw materials for use in Holland, and the exportation of Dutch produce, but it is, like Antwerp, a great port of transhipment for the Rhine Basin. Hence it imports food, mineral ores, and especially oil, for Germany, and exports coal and manufactured goods from the Ruhr coalfield. Only New York has a larger trade than Rotterdam, which handles half as much cargo again as London. *Europoort*, a new outport, is being built nearer the sea. Rotterdam also has very large margarine works, petroleum refineries, shipbuilding yards, and engineering and chemical works.

The Hague (600,000), on the western edge of the polders, is the seat of the government and of the International Court of Justice.

Eastern Holland

That part of Holland which lies mainly to the east of the polders is the least densely populated part of the country. This is the result of the relative infertility of large areas. The

soils are glacial deposits of the Ice Age, and are often sandy and pebbly. There are also large areas of peat bog. The whole district is often called the Geestland, and similar regions are to be found in the North German Plain and in Western Denmark. The great need for agricultural land has forced the Dutch to take measures to convert much of this once uncultivable region into productive farm land. This has been done by literally "re-making" the soil by a process of mixing the overlying peat and the underlying sandy soils, followed by the intensive use of artificial manures. The reclamation of the Geestland is comparable to the reclamation of the polders, and it is in these regions that the population is increasing most rapidly. But another factor also helps to account for the rapid increase in population in South Holland, and that is the discovery of coal. Coal is now worked to the east of Maastricht and in the Peel district farther north. Output is about 12 million tons a year. Because of the vast network of canals in Holland, the coal can be distributed easily and cheaply all over the country, but the rapid growth of the older towns and the development of new industrial centres is most marked in the south. For instance, Eindhoven (160,000), a town engaged in the manufacture of electrical equipment, doubled its population between 1921 and 1931. Among the important industries are the textile industries of Tilburg (wool), Breda, Arnheim and Nijmegen (rayon), and Enschede (cotton), tanneries, leather works, and the manufacture of bicycles—for which the flatness of Holland causes a great demand. All these towns have populations of between 100,000 and 130,000. At Arnheim also is a huge tin smelting plant using ore imported from Indonesia. Textile manufactures have increased considerably in recent years and now account for one-eighth of Holland's exports. Since the war, an extensive oilfield has been developed around Schoonbeek. There are large salt deposits near *Boekelo* (Overijssel). Production is nearly two million tons a year, about one-quarter of Holland's requirements.

Communications

Because of the general flatness of Holland transport is easy in all directions, and owing to the ease of canal construction and the network of navigable distributaries of the Rhine, water

transport is everywhere more important than transport by rail or road. Holland has 4,660 miles of canals and navigable waterways, 3,000 miles of road, and 2,250 miles of railway.

Trade

Holland ranks sixth among the nations in respect of foreign trade, owing largely to its transit and entrepôt trade. The Dutch merchant service ranks sixth in the world also. The main port, Rotterdam, the largest in Europe, depends upon the prosperity of the Rhineland industrial areas. Although Germany encourages the use of Bremen and Hamburg (especially for coal) by granting preferential tariffs on the railways, Rotterdam, heavily damaged in the war, has now regained prosperity. Its Rhine transit trade is now over 50 million tons a year, helped by a great increase in bulk cargoes of oil (more than 9 million tons a year), but the pipe line to Cologne, now working, will no doubt affect this.

Holland's most important industry is the processing of foodstuffs, closely followed by engineering (which employs over 300,000 people), with the manufacture of chemicals, third, and of textiles, fourth.

Holland's chief customers are Western Germany, Belgium, the United Kingdom, the U.S.A. and Sweden, and her imports come mainly from Belgium, Western Germany, the United Kingdom and Indonesia.

Dutch exports to Britain include bacon, condensed milk, bulbs, etc., but the quantity is much below that of former years. Foodstuffs form about one-third of Holland's exports and include meat, vegetables, milk and eggs. Industrial exports include engineering products (especially electrical and wireless apparatus), chemicals, textiles and ships. Machinery, tractors, motor-cars and raw wool and cotton, together with iron and other metallic ores, particularly tin, are received in return, but the chief need is an increase in the tonnage of coal entering Dutch ports. It is noteworthy that wheat, maize and flour figure prominently in the list of imports, showing that, in spite of highly-intensive agricultural development, Holland is not self-supporting with regard to food supplies or animal feeding stuffs. Crude petroleum is imported in large quantities and much of the refined products are exported.

CHAPTER V

THE COUNTRIES OF THE NORTH-WESTERN MARGINS OF EUROPE: (3) DENMARK

Position and General Characteristics

Denmark consists of the north-pointing peninsula of Jutland and some hundreds of islands, large and small, the chief of which, Funen, Zealand, and Laaland, lie between Jutland and the south of Sweden. Thus Denmark controls the three natural routes between the North Sea and the Baltic Sea, viz. via the Little Belt, Great Belt, and the Sound, the latter strait being only three miles wide at its northern end. In the south of the country, where Denmark and Germany meet, the peninsula is only thirty miles broad. The peninsular and insular form of Denmark, and the nearness of all parts of the country to the sea, have helped to develop an important fishing industry and a large mercantile marine.

Except for the island of Bornholm, which is composed of ancient rocks similar to those of Scandinavia, Denmark is structurally part of the Great European Plain. Although no part of the country reaches an elevation of 600 feet, it is not flat like the polder land of Holland, but undulating and well drained. The islands of Funen, Laaland, and Zealand and the eastern part of Jutland are covered with a mantle of fertile soils of glacial origin, but the western half of Jutland consists of sandy and pebbly soils similar to the Geestland of Holland. These soils are naturally unproductive, but, as in Holland, they have been converted into fertile agricultural areas by the addition of marl and lime and the intensive use of fertilisers.

On the extreme west of Jutland is a belt of sand-dunes similar to the coastal dunes of Belgium and Holland. These have been planted with pine trees and special grasses to prevent the sand being blown inland. The pine trees, as in the Landes of France, are becoming an important source of revenue in a country poor in forests.

Climate

Situated on the west of Europe, but to the east of the British Isles and so farther from the open Atlantic, Denmark has a climate similar to, but rather more extreme than, that of Eastern England. Its average rainfall is about 25 inches, and its summer temperature about 60° F. (*15° C.*) (cf. Eastern England), but its January temperatures average 32° F. (*0° C.*) [cf. Eastern England 38° F. (*3° C.*)]. It should be noted that the January isotherm of 32° F. (*0° C.*) passes from north to south through Denmark (see Fig. 7).

The Resources of Denmark

Denmark is a country of limited resources—

(1) Its position at the entrance to the Baltic Sea makes it important strategically, and up to 1857 " Sound Dues " were collected from all shipping passing through the Straits.

(2) Its close association with the sea and its nearness to the North Sea fishing grounds have given rise to an important fishing industry.

(3) It has no coal and no minerals except the kaolin of Bornholm, which is used for the manufacture of pottery. Tyne coal, however, because of cheap sea transport, costs little more in Copenhagen than in London.

(4) It has no swiftly-flowing rivers that can be used either for transport or for the development of hydro-electricity.

A small amount of electric power is carried to Copenhagen by submarine cable from Sweden. It is obvious that Denmark is not an industrial country. The manufactures are almost entirely confined to the preparation of agricultural produce for export, although machinery is manufactured and exported.

(5) Although originally a forested country, to-day less than 4 per cent. of the country is timbered, so that, unlike other countries, such as Norway, Sweden, and Finland, Denmark has no lumbering industry.

Thus it will be seen that the dominant resource of Denmark is agriculture, but even with regard to this there are a number of natural disadvantages, *e.g.* the infertility of large areas and the tendency of the climate to extremes of temperature and light rainfall. The conditions of temperature and rainfall

show that, climatically, Denmark is better suited to the cultivation of grain than to dairying, yet Denmark is the pre-eminent dairy-farming country of the world, exporting large quantities of bacon, butter, eggs and cheese. Up to the middle of the last century Denmark was a grain-growing country, and even to-day, on her more limited wheatlands, the yield of wheat (up to 30 cwt. per acre) is higher than in any other country in the world. The competition of cheap grain from the New World caused Denmark to change from grain growing to the rearing of animals. This does not mean that Denmark is a country of green pasture lands like Ireland, for it lacks the humidity and winter warmth which make the Irish pastures so luxuriant. Less than 20 per cent. of Denmark is used as permanent pasture, and 75 per cent. is still under the plough, but the crops raised are mainly for fodder, *i.e.* oats, barley, hay, clover and special grass crops. It is the aim of all Danish farmers to grow these crops and to rear dairy cattle, bacon pigs, and poultry (see plate facing page 80).

Reasons for the Importance of the Danish Dairying Industry

That Denmark should be the greatest dairy-farming country in spite of her obvious drawbacks is due to a number of causes most of which may be traced to the foresight, initiative and diligence of her people—

(1) Highly scientific methods of farming are practised and the educational system of the country is largely directed towards the increase of agricultural knowledge by the provision of State scholarships in agriculture, etc.

(2) The Danish Government maintains a rigid system of inspection both of the farms, to see that a satisfactory standard of cleanliness is maintained, and also of the export products to ensure that they are of high quality in order that the reputation of Danish products will be maintained abroad.

(3) Co-operative production has replaced the manufacture of butter, cheese and bacon on individual farms. Eighty per cent. of the milk produced is sent to the co-operative creameries, and 80 per cent. of the pigs are made into bacon and ham in co-operative factories. These methods result in a great saving of energy and expense, and make possible the financial

success of the smaller farms. Denmark is a country of small farms. Nearly three-quarters of the farms are less than 14 acres. There are approximately 9,000 co-operative societies in the country.

(4) Within easy reach of Denmark are a number of highly-industrialised and densely-populated areas (*e.g.* Britain, Germany) which provide a market for surplus dairy produce.

Fig. 39. THE ROUTES TO THE BALTIC AND THE POSITION OF COPENHAGEN.—Note that the Kiel Canal is not in Denmark but in Germany.

The Trade of Denmark

Denmark's exports consist very largely of bacon and dairy produce, and about one-third of this is exported to the United Kingdom and another one-fifth to Western Germany. In addition Denmark exports beef, and a large number of live cattle, to Western Germany.

To maintain her vast dairy-farming industry Denmark requires large quantities of feeding-stuffs; much of this comes from the Argentine.

Denmark imports coal and oil, textiles, machinery and manufactured articles. About one-quarter of her imports come from Western Germany and another quarter from the U.K.

Towns

Copenhagen (975,000) is situated on the east coast of Zealand, commanding the Sound, and contains one-fifth of the population of Denmark. It is the one great port of the country

and in former times became important because of its control of the route into the Baltic Sea (see plate facing page 80). The opening of the Kiel Canal, which shortened the journey between the North Sea and the Baltic by two hundred and forty miles, adversely affected its trade (Fig. 39).

Esbjerg (50,000) on the west coast of Jutland is the second port. It is an important fishing centre and from it a railway runs across Denmark to Copenhagen, the Great Belt being crossed by a train ferry. Another train ferry links Copenhagen with Helsingborg in Sweden.

The Faroes

The Faroes (Sheep Islands) situated between Scotland and Iceland are governed by Denmark, but have a certain measure of home rule. Sheep-rearing and fishing are the chief occupations of the people, more than 50 per cent. of the inhabitants being engaged in cod-fishing or whaling. The chief town is Thorshaven. The total population of the islands is only 30,000.

Iceland

The island has an area of about 40,000 square miles and a population of 170,000. Formerly Danish, it became an independent Republic in 1944. The main occupations are fishing (the annual catch is 4 tons per head of population) and sheep-rearing. These provide the exports which are exchanged for manufactures and foodstuffs. Reykjavik (70,000), situated on the south-west coast, is the capital. Despite their once remote position the people of Iceland have managed to attain a remarkably high standard of education and the Icelandic people possess a rich literary heritage in their native tongue. Iceland is now an important stage on several trans-Atlantic air routes, and has leased air bases to the U.S.A.

Volcanic activity, in the form of lava flows and hot springs, comparable with those of the North Island of New Zealand, provides a feature unique in Europe. Even before the war these phenomena attracted visitors in search of a "novel" holiday.

CHAPTER VI

THE COUNTRIES OF THE NORTH-WESTERN MARGINS OF EUROPE: (4) NORWAY

General Physical Features

Norway offers a great contrast to Denmark, for, whereas 75 per cent. of Denmark is cultivated, more than 70 per cent. of Norway consists of unproductive land. Forests are unimportant in Denmark, but in Norway they cover nearly one-quarter of the land surface. Only 3·6 per cent. of Norway is under cultivation (Fig. 43). Norway is slightly larger than the British Isles and has a population of 3½ millions.

Norway is the western portion of the Scandinavian peninsula. It is composed of a mountain mass of ancient rocks rising to over 8,000 feet, and is part of the Northern Highland system of Europe. Norway is widest in the south, where there are broad stretches of high plateau known as fjelds, above which rise the peaks of Galdhopiggen and Glitterkind. These fjelds are covered by extensive snow-fields and glaciers, from which valley glaciers flow, in some cases, down to sea-level. With the exception of the river Glommen, which flows north to south in south-eastern Norway, and forms a natural highway between Oslo and Trondhjem (Nidaros), there are no long rivers. Hundreds of short, swift streams, however, are an important source of electrical energy.

The Fiord Coastline

Norway has a fiord coastline (see plate facing page 81) and this coast is also characterised by an amazing number of islands (over 150,000) known as the "skerry guard."

The fiords, long, narrow, steep-sided indentations, deepened by glacial action, are drowned valleys (Fig. 41). The fiord sides often rise almost perpendicularly from the sea for several hundred feet, above which level the slope is more gradual. Streams from hanging valleys above plunge over the fiord side, forming magnificent waterfalls. The water is often over a

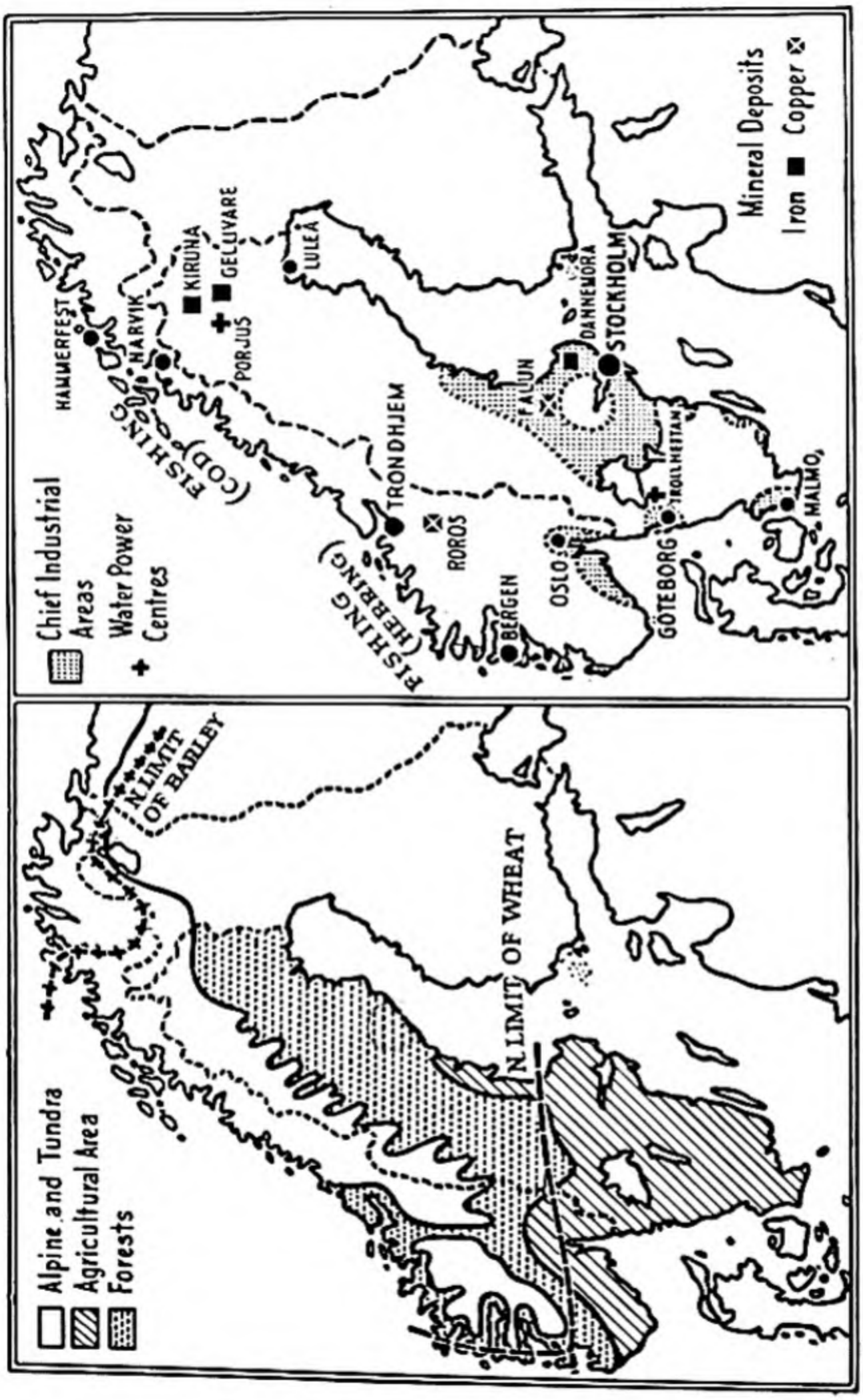


Fig. 40. (*a*) SCANDINAVIA—VEGETATION. (*b*) SCANDINAVIA—ECONOMIC RESOURCES.

thousand feet deep, but it becomes shallower at the seaward end of the fiord where there is a bar of solid rock or of morainic material. The sides of the fiord provide little room for settlement except where small " beaches " occur, but there is usually a small fertile plain of deltaic origin at the head of the fiord where a village is found. The resources of such regions are meagre. The calm waters of the fiord (protected by the bar) have fostered a love of seafaring, and the peoples of these coastlands are primarily engaged in fishing. The lower slopes of the fiords are often covered with coniferous forests which provide timber, not only for local use, but also for the manufacture of matches, pulp, etc. The swift streams can be utilised for the generation of hydro-electricity. Farming activities are limited by the lack of flat land. Where possible, oats, roots

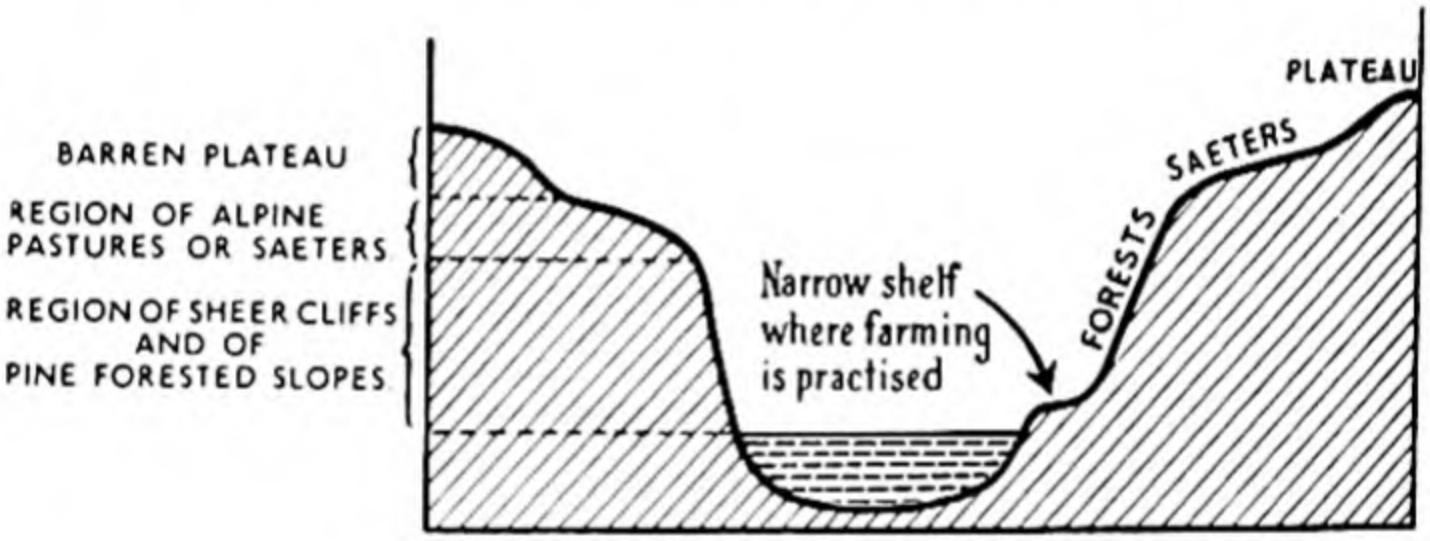


Fig. 41. Cross-Section of a Fiord.

and hay are grown. Cattle are pastured in summer on the *saeters* (*i.e.* the pasture lands above the tree line) and are brought down to the lower lands during the winter.

The total coastline of Norway, if straightened out, would stretch half-way round the Equator. The Sogne fiord (see plate facing page 96) alone is 130 miles long (*e.g.* about the same distance as from London to Bristol).

Climate

The south of Norway is in the same latitude as Northern Scotland. In spite of its northerly position (58° N. to 71° N.), the coasts of Norway are always ice-free, and in January the temperature of the Lofoten Islands is the same as that of Bulgaria, nearly 2,000 miles farther south. The abnormal warmth

Above A typical Danish landscape. Note the cornfields and the Danish Red cattle in the field, surrounded by an electrified wire fence. (*Danish Embassy*)

Below Part of the port of Copenhagen. (*Aerofilms Ltd.*)

Above The Flam branch of the Oslo-Bergen railway, showing the difficulties of communicatio
in a mountainous area. (*Norway Travel Association.*)

Below An arm of the Sogne Fiord. (*Norway Travel Association.*)

of the Norwegian winters is due to the warming influence of the South-West winds from the Atlantic and to the North Atlantic Drift (see Fig. 5). The rainfall of Norway is heavy, and though no systematic records are available for the mountain areas, it is estimated that in many places the rainfall is over 200 inches per annum. Another important factor is the length of the summer days. At North Cape there is continuous daylight for over two months. The length of the summer days is important in relation to agriculture, for barley will ripen in two months in the north of the peninsula, whereas it takes three months in the south. The climate is so humid and cloudy that hay often has to be hung on specially constructed fences to dry.

The Resources and Occupations of Norway

Norway has—

(*a*) Only a small percentage of lowland, the largest areas being in the south-east near Oslo and in the Glommen valley.

(*b*) Vast stretches of unproductive highland.

(*c*) Extensive forest lands.

(*d*) An ice-free and deeply-indented coastline.

(*e*) Very few minerals.

(*f*) A large number of swiftly-flowing streams.

These resources (or the lack of certain other resources) determine the major occupations of Norway, which are—

(1) Agriculture.

(2) Fisheries.

(3) Forestry.

(4) Manufactures.

(5) The Tourist Industry.

AGRICULTURAL ACTIVITIES.—Cultivation in Norway is limited by the high unproductive mountains. As a result only about one-thirtieth of the area is cultivated. The hard rock weathers so slowly that the soil is transported to the valleys almost as quickly as it is formed. Hence, on account of their thin soils, high altitudes, cold temperatures and inaccessibility, the plateau regions are totally unproductive.

Cultivation is limited to the more sheltered lowlands of the south-east (Fig. 40*a*), the valley bottoms and the narrow ledges of fertile land along the sides of the fiords. In spite of all these limitations, more people (31 per cent.) are engaged in agriculture than in any other occupation. Wheat can only be cultivated in the extreme south of Norway so that the chief crops are barley, oats, potatoes, and hay. There is a strong tendency for dairying to increase at the expense of cereal cultivation, and small amounts of dairy produce are exported, while large quantities of grain are imported. A notable feature of Norwegian agriculture is the use made of upland pastures or saeters. These are located above the forest belt at an elevation of 600 to 2,000 feet. Snow-covered in winter, they form excellent summer pastures. Most of the fiord and valley dwellers have both a lowland and an upland farm. On the former they cultivate during the summer crops and hay for winter use. Other members of the family live in crude dwellings on the saeters, tend the cattle, and collect and dry grass, which is brought down to the lowland farm to eke out the supply of winter fodder. As there is a shortage of good building stone the houses of the farmers are built mostly of wood. They are well equipped with electricity.

FISHERIES.—From earliest times the influence of the sea has been strong in Norway. The small amount of agricultural land bordering the fiords, and the barrenness and inaccessibility of the interior, caused the fiord dwellers to turn to the sea to eke out their means of livelihood. The calm waters of the fiords and the sheltered creeks between the islands were the nursery of a seafaring people, who in the early days of history set out on long voyages of discovery and settlement, to Britain, Iceland, Greenland, and America (*e.g.* the voyages of Lief Ericson about A.D. 1000). The nearness of the North Sea fishing grounds and the inherent love of the sea have led to the development of a great fishing industry with an annual catch of nearly 2 million tons, twice that of Britain. The most famous fishing grounds are those south of the Lofoten Islands, where immense quantities of cod and herring are caught (Fig. 40*b*). Tromso and Hammerfest are the chief centres of the cod fisheries, and Trondhjem (Nidaros) and Bergen are the chief centres of the herring fisheries. Canned

fish (*e.g.* Norwegian brislings) and fish oils are important items of Norwegian export. Whaling is becoming increasingly important, especially in Antarctic waters, where Bouvet Island is a Norwegian whaling station. Norway supplies over 50 per cent. of the whale oil of the world.

The familiarity with the sea helps to explain the importance of the Norwegian fishing industry, and also that of the Norwegian mercantile marine, perhaps the most modern in the world, which takes a large share of the carrying trade of the world, and ranks third in respect to tonnage, after Britain and the United States.

FORESTRY.—Although nearly one-quarter of Norway is forested, most of the valuable stands of timber are in the more sheltered south-eastern region. The western slopes of the Norwegian mountains are generally too steep and too exposed to strong winds for the growth of large trees. The most valuable of the western forests are in the neighbourhood of Trondhjem (Nidaros). Accessibility of the forests of the fiord slopes has led to extensive cutting for export, but 100 million new trees are being planted each year.

Large quantities of timber are used in Norway for building and for fuel, but there remains a large surplus. This was formerly exported as lumber, but to-day Norway does not supply much wood to other countries, but uses it as the basis of manufacturing industries, such as the manufacture of wood-pulp and paper. The short, swift streams of Norway are not suited to the floating of logs, but they provide the hydro-electric power for the factories.

INDUSTRIES.—Norway has no coal resources and her mineral ores, though varied, are limited in quantity. The chief are pyrites (which yield sulphur and copper), copper ores and aluminium ore.

Industries in Norway are mainly based on raw materials produced within the country and on water-power. Norway has many advantages for the development of hydro-electric power. The rainfall is evenly distributed throughout the year, so that the rivers maintain a constant flow; there are many waterfalls, and the rivers are swift flowing and do not freeze in winter. Hydro-electric power is most

intensively developed in Southern Norway near to the capital, Oslo, and to the heavily-forested regions. In Western and Northern Norway electricity is primarily used for domestic purposes. The development and use of hydro-electricity has caused a great increase in the manufacturing industries. Timber is manufactured into wood-pulp, paper and matches. There has been a rapid increase in use of electricity for the smelting of metal ores (especially aluminium) and the manufacture of chemicals, *e.g.* calcium carbide, and ammonia and nitrates for fertilisers. An important nitrate plant is situated at Såheim near the Rjukan Falls.

Fig. 42. THE POSITIONS OF OSLO AND TRONDHJEM IN RELATION TO THE GLOMMEN VALLEY.

Communications

One of the greatest difficulties in Norway is that of transport; this is partly due to the great distances involved in a long narrow country, and partly to the mountainous nature of the land (see plate facing page 81). The chief railway development is in the richer regions of the south-east and from Oslo three railways strike out north: (1) to Bergen, which involved the cutting of 178 tunnels; and (2) two routes to Trondhjem, one of which follows the Glommen valley. From Trondhjem northwards there is no railway except for a small length which links Narvik with Sweden, and which was built for

the special purpose of exporting Swedish iron ore from Gellivare via an ice-free port.

Oslo (460,000), the capital, is situated at the head of a long fiord in the south-eastern lowland of Norway. It is the centre of the most highly-developed area, and has rail communications with Bergen and Trondhjem, and also with Stockholm and Göteborg in Sweden (Fig. 42).

Bergen (115,000), less than one-third the size of Oslo, is the second largest town. It was an important city of the Hanseatic League, and to-day is responsible for large exports of fish to the Roman Catholic countries of Europe.

Trondhjem (Nidaros), at the northern end of the Glommen depression, is the ancient capital of Norway and the centre of the most productive and most heavily-forested region of the west coast. It is also the ecclesiastical capital of the country.

No other town in Norway has a population exceeding 50,000, and most of them are comparable in size with small English market towns The total population of Norway is about 3,500,000.

Trade

It is clear from the nature of her occupations that the exports of Norway will consist of fish, fish products, wood-pulp, paper, cardboard, timber, and chemicals. Her imports include grain, food for animals, coal, and a vast range of manufactured goods, including textiles and machinery.

Norwegian Possessions

Spitsbergen lies some 400 miles to the north of Norway. It was probably discovered by the Norwegians in the 12th century, and in the 17th century was an important whaling station. The sovereignty of Spitsbergen has often been a matter of dispute, but when the rich coalfields of the island were discovered at the beginning of this century the matter of settlement became important. It officially became a Norwegian island in 1925. There are six mining camps, the largest of which is Longyearbyen with 500 inhabitants. Output is nearly half a million tons a year.

Norway also controls the small *Bouvet Island* in the South Atlantic on account of her large interests in the whaling industry of the Antarctic Ocean.

CHAPTER VII

THE COUNTRIES BORDERING THE BALTIC SEA: (1) SWEDEN

The countries bordering the Baltic include Sweden, Finland, Germany, Poland, and the Soviet Republics of Estonia, Latvia, and Lithuania. Other parts of the Soviet Union also reach the Baltic in the east, but climatically they are of the Continental rather than the Baltic type.

The Baltic Sea

The Baltic Sea is an almost enclosed sea which extends eastwards into the heart of Northern Europe. Leningrad, at its most easterly point, is more than 1,000 miles from the open Atlantic. Because of the vast quantities of fresh water added to the Baltic by rivers it has a low salinity and freezes easily. The length of time during which the Baltic ports are frozen annually increases eastwards and northwards. Thus near the mouth of the River Oder the sea is only frozen for twenty days, but at Danzig the period has increased to three months, and at Leningrad it is five months. Stockholm is icebound for less than two months, but the period increases northwards, and Lulea, at the northern end of the Gulf of Bothnia, is frozen for six months. The Baltic Sea not only provides a water highway into Northern Europe, but it has a considerable influence on the climates of the surrounding countries, which have less extreme temperatures, and more rainfall than they would have if the Baltic Sea did not exist. Thus the Baltic has the effect of making the climate changes between Britain and Central Russia more gradual, and the Baltic type of climate is therefore a transitional type. In general the summers vary from hot in Central Germany to cool in Finland; the winters are everywhere below freezing point, the winter cold increasing eastward; and the rainfall is light (average 20 inches), falling at all seasons, but with a summer maximum.

Sweden in Contrast with Norway

Sweden is the eastern portion of the Scandinavian peninsula. It differs from Norway in a number of ways, viz.—

(*a*) Since most of its coastline faces the Baltic, which is frozen for at least one month during the winter, and since it lacks the deeply-indented coastline and well-developed island fringe of Norway, its maritime activities and fisheries are of minor importance.

(*b*) A quarter of Norway is forested, and over half of Sweden, but, in view of the greater area of Sweden, the latter has more than three times the area of forest that Norway has (Fig. 43).

(*c*) Sweden has a greater extent of lowland than Norway, the climate is not so humid, so Sweden has a much greater area devoted to agriculture.

(*d*) Sweden has much larger mineral resources than Norway, and particularly of iron ore (see Fig. 40*b*).

(*e*) The streams of Sweden are less swift than those of Norway, hence, while they are of much greater value for lumbering, they do not form quite such an important potential source of hydro-electric power.

(*f*) In spite of its greater size Sweden has a smaller area of unproductive land than Norway.

(*g*) The population of Sweden—7,500,000—is more than double that of Norway.

Fig. 43. DIAGRAM TO SHOW PERCENTAGES OF THE TOTAL AREA OF NORWAY, SWEDEN AND FINLAND WHICH IS CULTIVATED, UNPRODUCTIVE, OR FORESTED.
(The heights of the columns are proportional to the areas of the countries.)

Divisions of Sweden

Sweden can be divided into four regions—

(1) Norrland.
(2) The lake depression.
(3) The plateau of Småland.
(4) Scania.

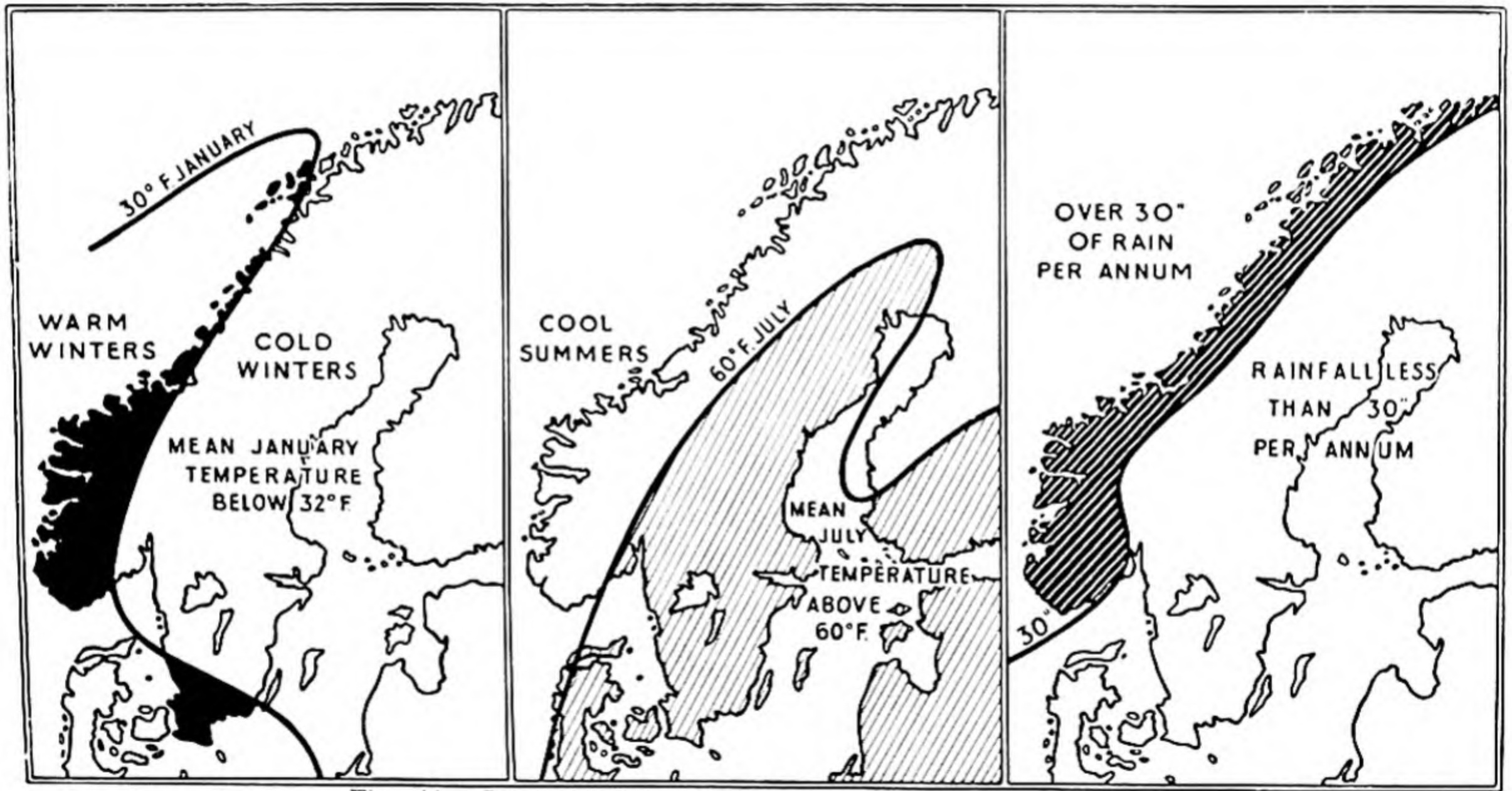


Fig. 44. Climatic Contrasts between Norway and Sweden.

(1) NORRLAND.—This part of Sweden lies north of Lat. 61° N. It extends from the crest of the Scandinavian mountains on the west, and drops gradually eastward to the Baltic Sea. It is drained by innumerable parallel streams, in the upper courses of which are long, narrow and deep lakes formed by the erosive action of the glaciers and the deposition of morainic dams across the river valleys. In the west of Norrland is a high unproductive plateau region upwards of 5,000 feet in elevation. This plateau forms a barrier to communication between Norway and Sweden except in the latitudes of Trondhjem and the Lofoten Islands, where the crest is lower, and at these points railways cross the barrier.

Below the level of the plateau are the east-facing slopes, everywhere covered with extensive forests of pine, fir and birch.

The coastal plain, a region of uplift, is an area of fertile soils. The coast is broken by numerous indentations known as fiards (not similar to the Norwegian fiords), and there is a fringe of tiny islands. This large region of Norrland was virtually uninhabited until the end of last century, when the forest wealth was exploited, and to-day it is one of the greatest producers of timber in the world. The rivers are so numerous that there is hardly a lumber camp which is more than five miles from a waterway suitable for the transport of logs. But the forests are not the only resource of Norrland. The coastal plain is cultivated, and produces crops of oats, barley and rye, etc. There are also important mineral deposits, *e.g.* the iron ores of Gellivare and Kiruna (see Fig. 40). Because of their great distance from the manufacturing centres of Southern Sweden most of these ores are exported, partly through Narvik (Norway) during the winter months, when the Baltic is frozen, and partly through Luleå during the summer months. Some forty miles east of Gellivare is a great hydro-electric power station at Porjus, which supplies the power for the Luleå-Narvik railway. Most of Sweden's pig iron is obtained from iron ore smelted electrically near Luleå.

The towns of the coast are mostly small (10,000-20,000 inhabitants), and are centres for saw mills, the manufacture of paper and wood-pulp, and the exportation of timber.

In the extreme north of Sweden and in the neighbouring districts of Norway and Finland is Lapland. The Lapps are a

nomadic people who depend on their herds of reindeer, and, where they live near the sea, on fishing also.

(2) THE LAKE DEPRESSION (Fig. 45).—Immediately to the south of Norrland is a lowland, the Lake Depression, extending from the Skager Rak to Stockholm. In it lie the large lakes, Vener, Vetter, and Mälar. These lakes are joined by a canal so that there is a complete waterway between the two greatest cities of Sweden, viz. Stockholm, the capital, on the east, and

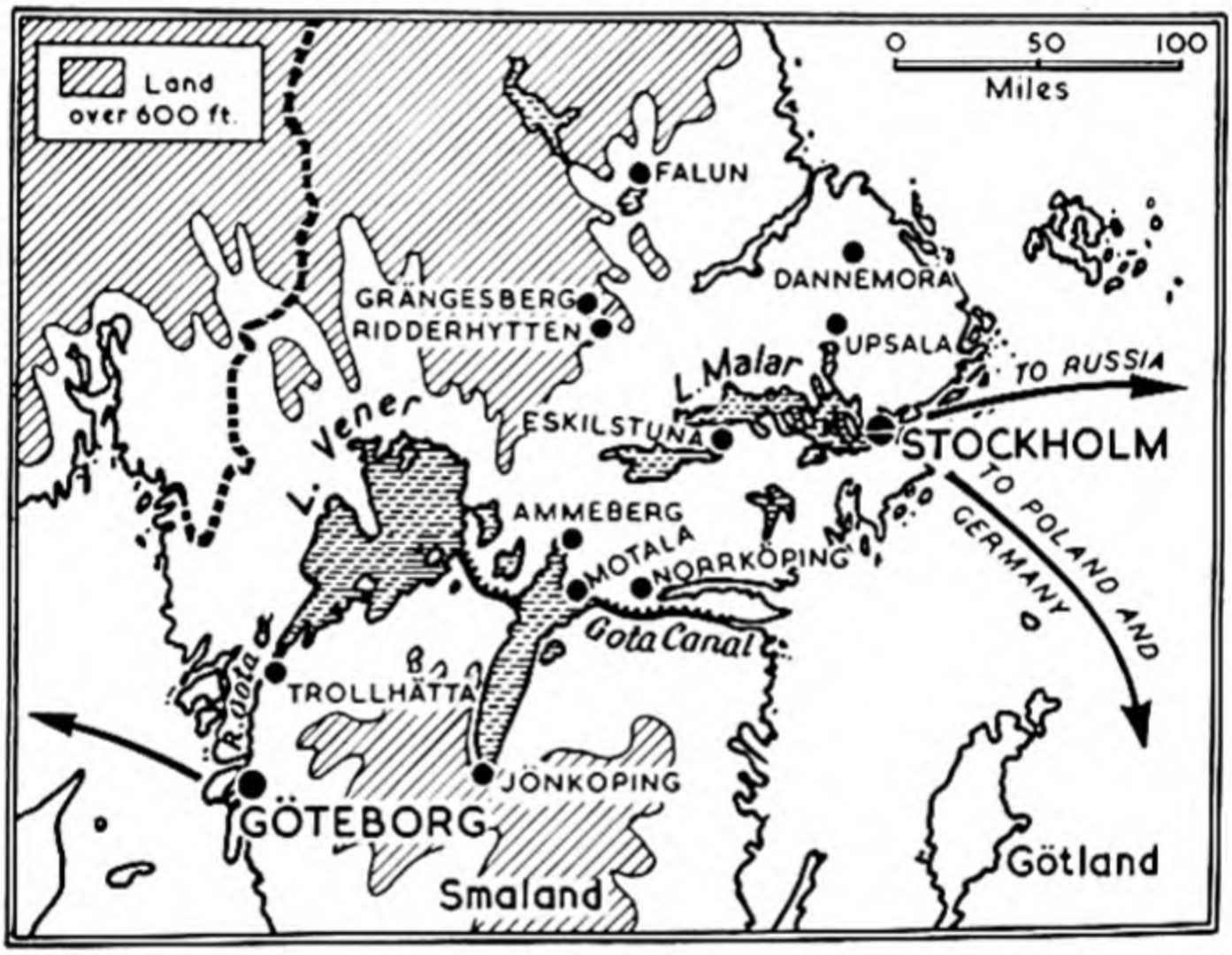


Fig. 45. THE LAKE DEPRESSION OF SWEDEN.—Note the waterway linking the east and west coasts and also the positions of Stockholm and Göteborg at the ends of the "thoroughfare."

Göteborg, the great western outlet of the country. Not only is this the main "thoroughfare" of Sweden, but it is well developed both agriculturally and industrially. Potatoes and cereals (except wheat) are grown, and dairy cattle are reared. There are rich mineral deposits, viz. iron ore at Grängesberg and Ridderhytten, zinc at Ammeberg, lead in the Sagan valley west of Upsala, and copper at Falun.

In the days when charcoal was used for smelting, this region had important iron industries, and was the chief producer of

iron in Europe, until the use of coal and coke revolutionised the industry. Because of the shortage of coal in Sweden the chief metal-working centres are to-day situated near the coast, where supplies of imported coal are cheapest. The engineering industry includes the manufacture of cream separators, ball-bearings, lighthouse apparatus, telephone equipment and electrical machinery. Some of the principal centres are the port of Norrköping; Motala, on Lake Vetter; and Eskilstuna, on Lake Mälar. Trollhettan, the Niagara of Sweden, is a great hydro-electric centre on the river Göta, which flows from Lake Vener.

Stockholm (800,000), the capital of Sweden, grew up on and around a small island at the eastern end of Lake Mälar. Its suitability for defence made it a great Viking stronghold. It controls routes westwards across the Lake Depression, northwards to the forested areas, and lies opposite the Gulf of Finland, which gives access to Russia. Its disadvantages are that it is not ice-free, and that it lies on the side of Sweden away from the main trading routes.

Göteborg (400,000), on the west of Southern Sweden and at the mouth of the River Göta, is at the western end of the Lake Depression and is the great trading centre of the country (see plate facing page 96). It is ice-free, in direct contact with the busy nations of Western Europe, and has excellent canal and railway communications with all parts of Southern Sweden. In view of its shipping interests, its easy access by sea to Swedish iron ore and imported coal, it is not surprising to find Göteborg has important shipyards.

Norrköping (90,000), another important port on the east coast, is not only a metal-working and engineering centre, but has important textile industries.

(3) SMÅLAND.—This region is a plateau of ancient rocks rising to about 1,000 feet and occupying the central area of Southern Sweden. It is an area of forests, swamps and moor-land, and the population density is low. The only cultivable lands lie around the edges of the mountain core. One of the most important towns of the interior is Jönköping, at the southern end of Lake Vetter. This is the great centre for the manufacture of matches, which are produced in immense

quantities, and exported to all parts of the world. The location of the match industry is primarily due to the fact that the inventor of safety matches was a native of Jönköping, and also to the availability of raw materials. Karlskrona, on the south coast, is the Swedish naval station.

(4) SCANIA.—The peninsula of Scania, at the extreme south-west of Sweden, is composed of newer rocks similar to those of Denmark. Because of its southerly position, warmer temperatures, and fertile soils, it is the richest agricultural region in the country. Wheat can be grown as well as oats, barley and rye, and the production of dairy produce is sufficiently large to give a surplus for export. Sugar-beet is also cultivated. There are some small deposits of coal in this region. The chief town and port of Scania is Malmö (210,000). In winter the harbour has to be kept open by ice-breakers. It has important ferry connections with Copenhagen.

The Trade of Sweden

The trade of Sweden is primarily with Britain, Germany and U.S.A. She receives most imports from Germany, and sends most exports to England. The chief exports are machinery, vehicles and ships (Sweden ranks fourth in the world as a shipbuilding country), followed by wood-pulp, paper and timber. Sweden has specialised in the manufacture of certain types of machinery, especially high-grade electrical apparatus, and of other iron and steel goods, *e.g.* ball-bearings. Mineral ores rank high in the export list (*e.g.* the iron ore of Gellivare), and the export of dairy produce is increasing. Sweden buys large quantities of coal from Poland, to which country iron ore is exported. Textile manufactures head the list of imports, followed by coal, petroleum, foodstuffs and machinery not manufactured in Sweden.

CHAPTER VIII

COUNTRIES BORDERING THE BALTIC SEA: (2) FINLAND AND THE RUSSIAN BALTIC REPUBLICS

FINLAND

Position, Relief and Climate

Finland lies to the north-east of the Baltic Sea and north of the Gulf of Finland. For several centuries Finland was politically part of Sweden, and much of the progress and development achieved may be traced to this former connection. For practically the whole of the nineteenth century Finland was politically linked with Russia, but gained her independence after the Russian Revolution of 1917.

Finland is a low plateau of ancient rocks worn down by ice action. Large areas are composed of bare rock, but in other districts there are extensive morainic deposits. Rivers wind about among small rounded hills, and water collects to form lakes, both in the rocky hollows scooped out by the ice and in the depressions of the hummocky morainic areas.

There are 35,000 lakes in Finland, and one-third of the area is composed of lakes, bogs and marshes.

Although Finland lies so far north (*i.e.* entirely north of 60° N.), because of its position to the east of Scandinavia away from the moderating influences of the Atlantic, its summer temperatures are similar to those of South-Eastern England. The winters are, however, much colder than those of England, viz. 20° F. (*−7° C.*) in the south to 10° F. (*−12° C.*) and less in the north-east. The average annual rainfall is about 20 inches, the winter snowfall being heavy. In the south-west the ports can usually be kept open for shipping by the use of ice-breakers.

Occupations

The chief occupations are those concerned with agriculture and forestry, though there is some industrial development in the towns of South-West Finland, largely due to the former political connections with Sweden.

AGRICULTURE.—Finland has less agricultural land than any other European country except Norway (see Fig. 43). In spite of this, more people are engaged in agriculture than in any other occupation, but it must be remembered that many of the men engaged in lumbering during the winter turn to agricultural occupations during the summer. The principal areas of cultivation are along the south-west coastal plain, where climatic conditions are least severe, and in the valleys and along the lake shores (Fig. 46). The chief crops, as in the other countries of Northern Europe, are hay, potatoes, oats, barley, wheat and rye. Because of the greater length of the summer days, grain will ripen in a shorter period in the north than in the south of the country (cf. Norway, page 91). In recent years dairying has increased in importance, and butter is exported chiefly to Britain. Co-operative societies, similar to those of Denmark, have been formed, and the dairying industry will probably continue to grow.

Fig. 46. FINLAND. ECONOMIC DIVISIONS.

FORESTRY.—Finland lies in the cool temperate forest belt. Over 70 per cent. of the country is forested, the chief trees being pine, fir, larch and birch (see Fig. 43). The percentage of forested area is greater than that of any other European country, and Finland ranks second to Canada as an exporter of timber and wood products. The total exports of wood and

wood products account for 85 per cent. of the total value of the export trade of Finland. Imports include coal, petroleum, textiles and other manufactured articles.

The importance of forestry is due to—

(1) The large extent of forests.

(2) The absence of other important resources.

(3) The unsuitability of much of the cleared land for agriculture, so that re-afforestation is practised.

(4) The winter covering of snow which is an advantage for lumbering operations.

(5) The large number of streams which can be used for the transport of logs.

(6) Numerous waterfalls and rapids (*e.g.* Imatra rapids), which make possible the generation of cheap electric power.

MANUFACTURES.—Industrial development is related to the two great resources of wood and water-power. The chief industries include the manufacture of wood-pulp, paper, cardboard, cellulose, veneer, plywood, bobbins and matches. Textiles, chiefly cotton goods, are manufactured at *Tampere* (Tammerfors, 120,000).

Helsinki (Helsingfors, 450,000) is the capital and chief port. It is situated on the Gulf of Finland, and though its harbour is frozen for nearly four months, communications are usually maintained by means of ice-breakers.

Hanko (Hangö) and *Turku* (Abö, 120,000), the former capital, are frozen for a shorter period, and the former is the chief port for the exportation of butter.

There are a number of railways in Southern Finland, often built in the hope that they would lead to agricultural settlement in the interior. This, however, has not generally materialised because of the infertility of the soils, derived from the ancient rocks. The northern portion of Finland is economically poor. It is an area of tundra inhabited by nomadic tribes such as the Lapps. The total population of Finland is about 4,400,000.

THE RUSSIAN BALTIC REPUBLICS

General

The name Baltic States is still sometimes applied to the Soviet Republics of Estonia, Latvia, and Lithuania. These countries, like Finland, were formerly part of the Russian Empire, and were for a short time independent after the Russian revolution of 1917. In 1940 they were reincorporated in the U.S.S.R. and became Communist states.

These countries lie on the east side of the Baltic and south of the Gulf of Finland. They are lowland areas structurally part of the Russian platform. Estonia, heavily glaciated, and with much of its surface soil removed, resembles Finland. Latvia and Lithuania, covered with thick morainic deposits, are similar to the neighbouring plains of Central Russia and North Germany. The chief rivers are the Dvina, which flows westward through Latvia, and the Niemen, which forms part of the southern boundary of Lithuania.

The Peoples

The structural, climatic and occupational similarities of the region are so obvious that it might be wondered why it has been divided into three political divisions with a total population of only six million. These divisions are ethnographic, that is, they are based on cultural differences.

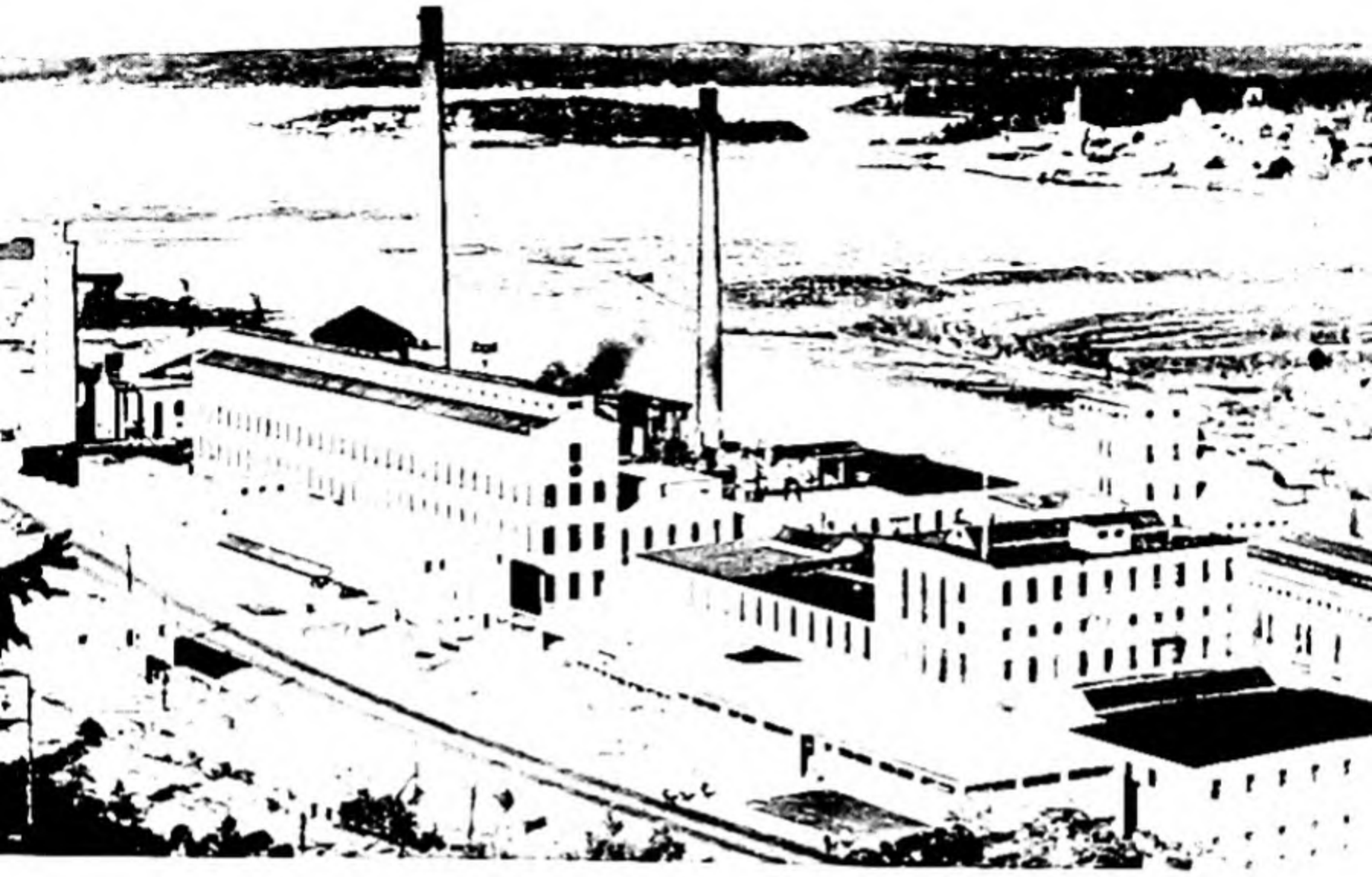
Estonia is inhabited by Esths, a people akin to the Finns; Latvia by Letts, whose language and Protestant religion differ from that of the Esths; Lithuania by Lithuanians, who are Roman Catholic, and whose language also differs from those of Estonia and Latvia.

The policy of the Soviet Union has been to try to reduce these regional cultural differences and to assimilate these states more closely to the Russian pattern. In pursuance of this policy many leading citizens of these states have been deported to other parts of the Soviet Union.

After the War of 1939-45 Lithuania gained a part of Poland including Vilna (240,000), which is now the capital.

Occupations

AGRICULTURE.—Situated farther south, the Baltic Republics are somewhat warmer in both summer and winter than Finland, hence the climate is more favourable to agricultural development.



Above A wood-pulp mill near Sundsvall (*Swedish Travel Bureau*)

Below The harbour at Gothenburg, Sweden's greatest seaport (*Swedish Travel Bureau*)

Above Poland the Walbrzych Iron and Steel Works in Silesia in winter. (*Polish Embassy*)

Below Poland Zelasno, a holiday resort in the Bystrica Valley, Upper Silesia. (*Polish Embassy*)

The crops grown are, as in other North European countries, barley, oats, rye, and potatoes. In addition to these crops, spring wheat is grown because of the higher summer temperatures. The total cereal harvest is 1½ million tons a year, about half of it rye. In addition, some sugar-beet is grown in Latvia and Lithuania.

Per head of population there are twice as many cattle and pigs as in the United Kingdom but fewer sheep. The economy of all three republics is largely an agricultural one and with the emphasis more on stock raising than on arable land. Butter and meat (including bacon and pork) are important

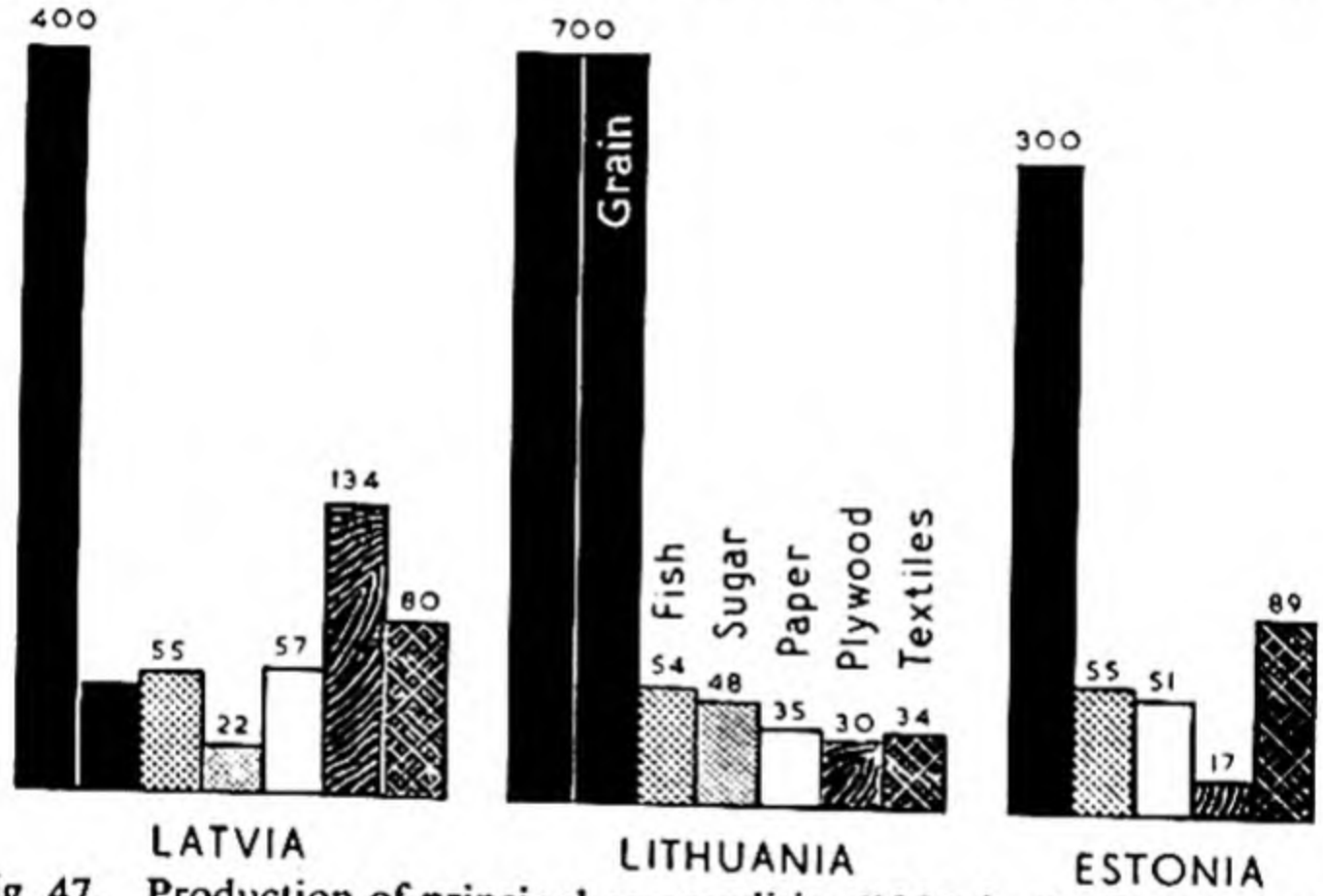


Fig. 47. Production of principal commodities (1955) in the Soviet Baltic Republics, in thousands of tons. In comparing output it should be borne in mind that the population of Latvia is nearly twice, and of Lithuania nearly three times, that of Estonia.

articles of export, and considerable quantities of fish are landed.

In the past these lands were divided into large estates owned by the Balts or German barons. These landlords, absent from their estates for long periods, insisted on a type of agriculture, mainly cereal growing, which was not economically sound. Since the war, agriculture has been reorganised on a collective basis on Soviet lines (see p. 237).

FORESTRY.—The Baltic States are situated in the cool temperate forest belt of Europe, but there has been far more extensive deforestation than in such countries as Finland and Sweden.

In spite of this there are large forest areas, so that lumbering and the manufacture of wood products, such as wood-pulp, paper and cellulose, are important throughout the region.

INDUSTRY.—Apart from oil shale in Estonia (production 8 million tons a year) there is practically no mineral wealth, but the U.S.S.R. has recently announced the discovery of oilfields in the Baltic depression near Kaliningrad (Konigsberg), in the Ukraine nearby.

While all three countries are mainly agricultural, the Soviet Union, here as elsewhere, is endeavouring to speed up industrialisation. Many of the small industries already established depend on agriculture or forestry, the manufacture of plywood, of wood pulp and paper, the refining of sugar, the making of butter, and the curing of bacon. All three republics have small textile industries. Some steel is made in Latvia and there is a little shipbuilding. Also in Latvia is some light engineering and half a million wireless sets are produced annually. Lithuania is the least industrialised of the three.

Commerce

Prior to 1918, the ports of Riga (600,000), Reval (Tallinn, 250,000), Libau (Liepaja) and Memel (Klaipeda) were very important outlets for Russian trade. This was largely because they were ice-bound for a shorter period than Leningrad. Libau, for instance, could in most winters be kept open by ice-breakers, and it had direct rail communication with the wheat lands of the Ukraine. To maintain transit trade for Russia, the main railway lines of Latvia, converging on Riga, were converted to the Russian gauge. Nevertheless, political separation from Russia resulted in a great decrease in the trade of these ports. Reunion with Russia made little difference because for many years Russia's external trade, by sea at any rate, was very small. Most of the external trade of these republics, is, as would be expected, with other parts of the U.S.S.R., with Poland and with the East German Republic. However, with Russia now becoming a rapidly increasing exporter of oil, Baltic ports have an advantage over Black Sea ports for export to Western Europe. Klaipeda is being developed as a crude oil port and is being linked with the Central Russian pipeline (p. 252). A large refinery is being built at Ventspils (Windau) which will export refined petroleum products.

CHAPTER IX

THE COUNTRIES BORDERING THE BALTIC SEA: (3) POLAND

The boundaries of Poland were fixed in 1918 according to language and national sentiment, although a considerable Russian minority lived in the eastern provinces.

As a result of the war of 1939-45 Poland has shifted westward, having lost to the U.S.S.R. about 70,000 square miles in the east, mainly primitive farm land and forest but including the towns of Lwow (Lemberg) and Vilna. At the same time she has gained about 46,000 square miles in the west with highly productive soil and great industrial possibilities. Many coal mines, textile factories, paper mills, iron and steel works, have already been restored and have brought Poland into the front rank of industrial nations. Moreover, she now has an additional 250 miles of Baltic coastline with the ports of Danzig (Gdansk) and Stettin (Szezecin) as well as her modern artificial port of Gdynia. The population is nearly 30 million.

Even before the war Poland exported ten million tons of coal a year and her mining areas in Silesia acquired after the war have nearly doubled her resources. To-day Poland produces 95 million tons of coal a year and is the leading European exporter of coal. She also produces considerable zinc.

Position and Relief

The boundaries of the new Poland extend along the Baltic from a point west of Konigsberg (Kaliningrad) to a point east of Swinemunde with the rivers Oder and Neisse forming a frontier with Germany, the town of Stettin (Szezecin) coming within Poland. On the east the boundary runs from the Baltic, along the higher land between the Vistula and Pripet to the Carpathians.

The country forms part of the European plain rising southwards to the Carpathians.

Climate

Climatically, it has a more continental type of climate than other Baltic lands. Extremes of temperature increase from

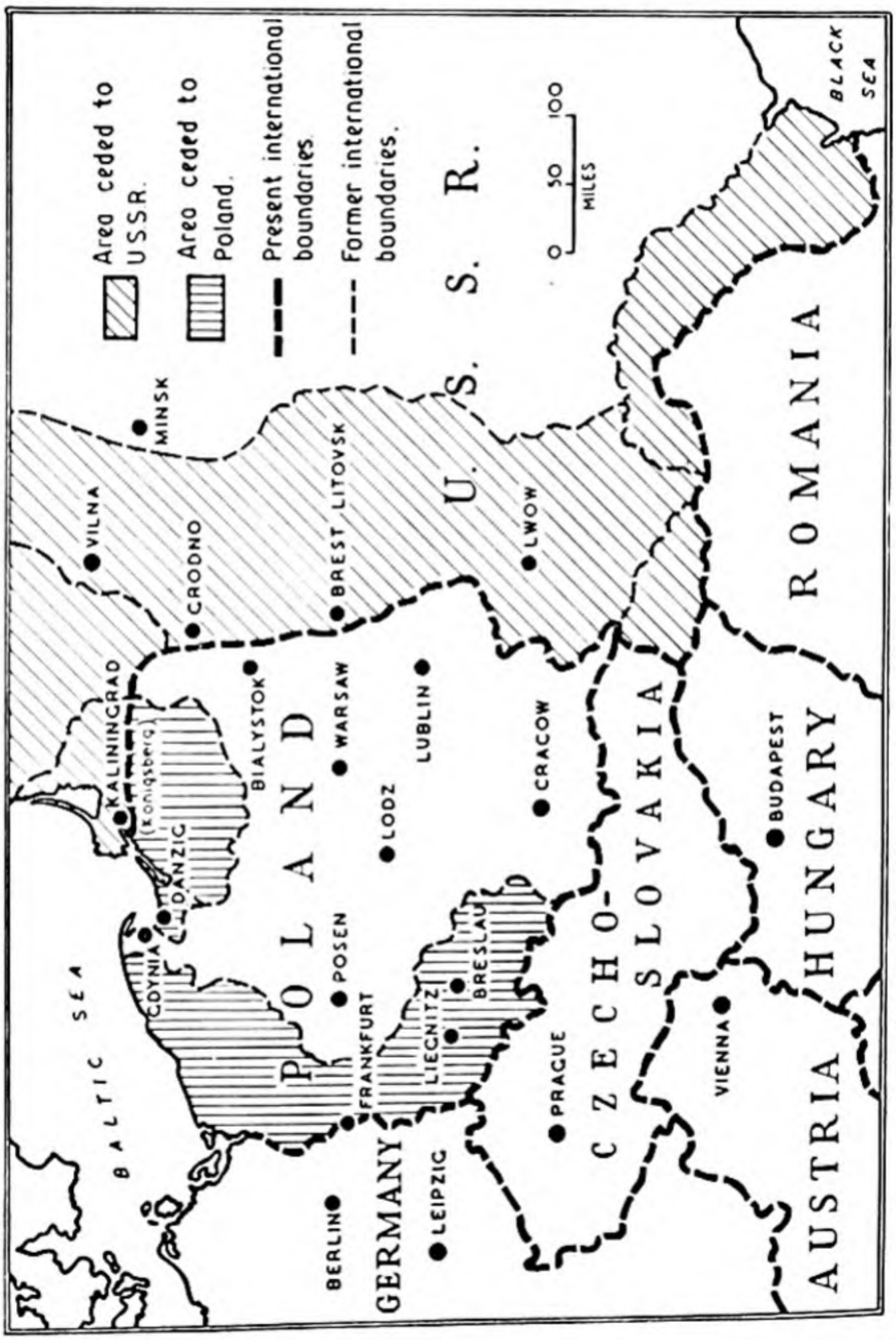


Fig. 47 (*a*). Territorial Changes in Eastern Europe.

west to east and from north to south. The annual rainfall averages 20 inches per annum, most falling in the summer.

Natural Regions and Occupations

Poland may be divided into the following areas:—

(1) The northern regions.

(2) The lowland plains of the central belt.

(3) The southern plateau.

(4) The Carpathians.

(1) THE NORTHERN REGIONS.—Poland has a fairly regular coastline, fringed by sand dunes and haffs, leading to infertile

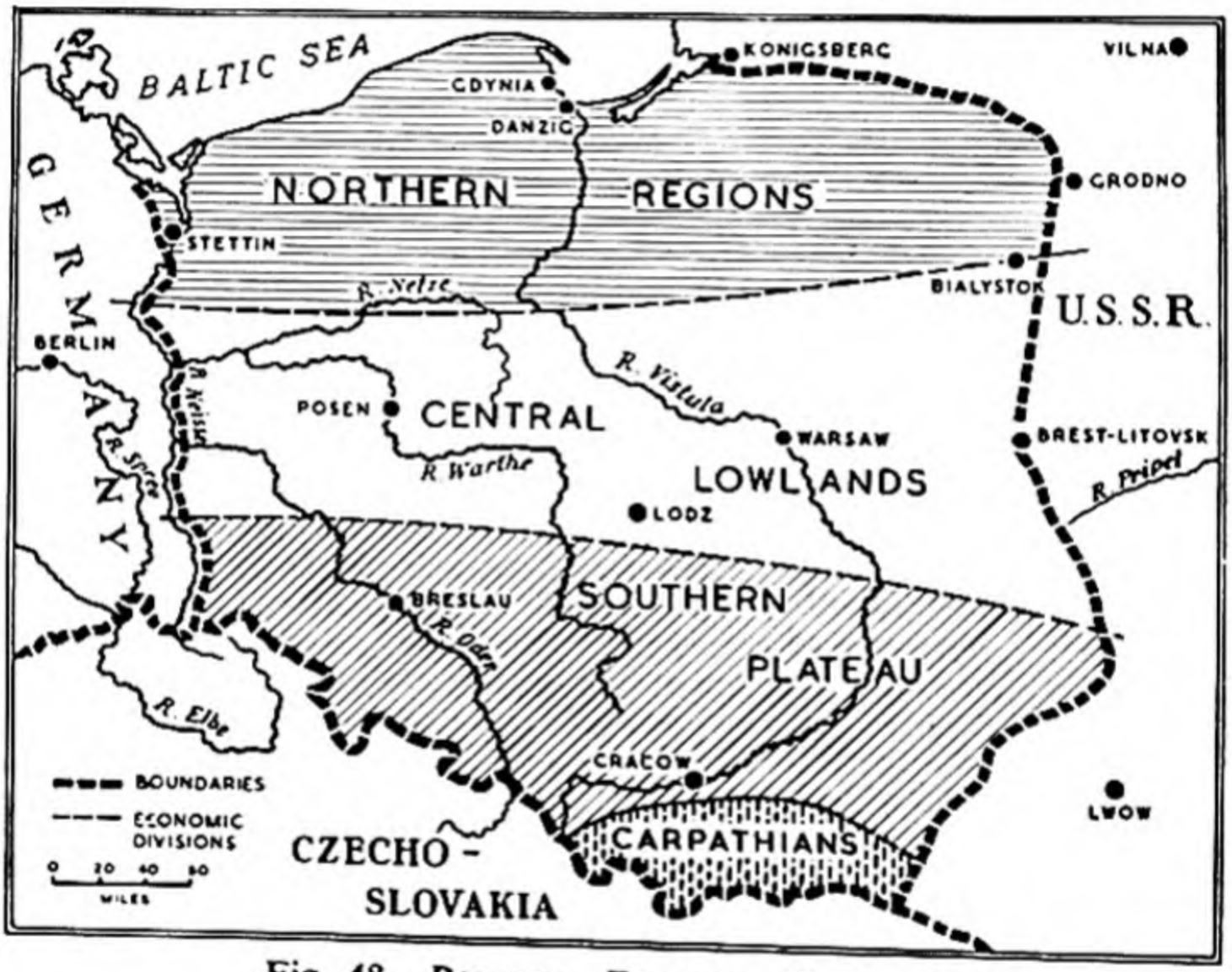


Fig. 48. POLAND. ECONOMIC DIVISIONS.

" geest " areas and morainic heights. Much of the area is still forested, but in the lower valley of the Vistula the cultivation of cereals and of sugar beet is carried on, while dairying is of considerable importance.

The chief towns are Danzig (Gdansk, 280,000) and Gdynia (140,000), the outlets for the trade of the Vistula basin. Gdynia lies to the west of the river mouth and was built especially to give Poland a seaport within her complete control, during the

period when Danzig was under an international régime. Gdynia became the chief port of export for coal to the Scandinavian countries and timber to Britain, receiving in exchange iron ore, manufactured goods and fertilisers. Danzig, in future, may have a greater share of this trade. Both Gdynia and Danzig are important for shipbuilding.

Bromberg (Bydgoszcz, 200,000), at the great bend of the Vistula, is an engineering centre and a junction for the route from the west via the Netze valley and the Vistula valley.

(2) THE CENTRAL LOWLAND.—This is the heart of Poland extending from the River Oder in the west to the Russian frontier in the east. In part, this lowland consists of undulating areas of glacial deposits, and in part, of broad, flat and often marshy valleys which were formed by the waters of the melting glaciers of the Ice Age, such as the east-west depression occupied by the Middle Vistula and the River Warta (a tributary of the Oder). These conditions are continued beyond both eastern and western frontiers and canal links between the rivers provide an important European waterway (see Fig. 52).

Agriculturally, the region may be considered as transitional between Germany and Russia. In the *west* much benefit accrued from German agricultural research and up-to-date methods, so that farming flourished and yields were high. The chief crops are rye, oats, potatoes, sugar beet, flax and wheat. Rye and potatoes are largely used for food, but the potato crop is so big (the third largest in Europe) that there is a large surplus which is used for the manufacture of alcohol.

Similarly the cultivation of flax, sugar beet and barley provided materials for local factories and left considerable quantities for export. To what extent these will again be available depends upon the success of the plans formulated by the present Polish government for the development of industries and making good the devastation due to the war. Westward expansion will mean a greater attention to dairy-farming and stock breeding, if only to satisfy the demands of the industrial centres such as Frankfurt and Stettin which now come within the Polish borders.

Towards the east, agriculture is less well developed and yields are lower. Much of the land is forested. All available evidence. however, leads to the conclusion that considerable

progress towards recovery has already been made on the farms of Polish East Prussia and in the province of Bialystok.

Warsaw (Warszawa), the capital, suffered severely during the war years and the population of over a million people experienced cruel privation. The city is situated on high ground at a bend of the Vistula. Its great importance as a route centre is largely due to the ease of east and west communication along the old glacial lowlands. Like all capital cities it has a large number of industries many of which cater for the immediate needs of the inhabitants, *e.g.* sugar refining, flour-milling and engineering.

To the south-west of Warsaw is Lodz (680,000), the "Manchester" of Poland. Its textile (mainly cotton) and engineering industries owe much to German influence and organisation. Though it is nearly 100 miles from the Polish coalfield, it ranks as the greatest industrial centre of the country.

Stettin (Szezecin, 250,000) has important shipbuilding yards.

(3) THE SOUTHERN PLATEAU.—The south of Poland consists of a low plateau (upwards of 600 feet) dissected by the broad valleys of the Vistula and its tributaries. Here the flatness of Central Poland gives place to rolling upland country separated by fertile vales. This is the most favoured region of Poland both agriculturally and industrially. Large areas are covered with fertile loess, summer temperatures are high because of the southerly position, and rainfall is sometimes heavier than elsewhere on account of the proximity of the Carpathians. This is the richest wheat-growing region of Poland, particularly towards the extreme east. Dairying is important because of the proximity to the densely-populated industrial region to the south, where the Silesian coalfield is situated. Except for the Teschen area, which forms part of Czechoslovakia, this coalfield is now entirely within Poland. The coal is of good quality, easily worked, and there are immense reserves. A considerable part of the output is exported and accounts for the bulk of the present exports. The Scandinavian countries provide a convenient market.

Silesia has also deposits of iron, lead and zinc ores. The industries of the coalfield are therefore primarily concerned

with metal working (see plate facing page 97). There are extensive salt deposits to the south of Cracow, the chief industrial area on the upper Vistula. These have led to the development of chemical industries. Cracow (470,000) is important as a strategic and route centre for it controls the natural route south-westward through the Moravian Gate, between the Carpathians and the uplands of Bohemia, to Vienna. A very large new plant for the smelting of iron

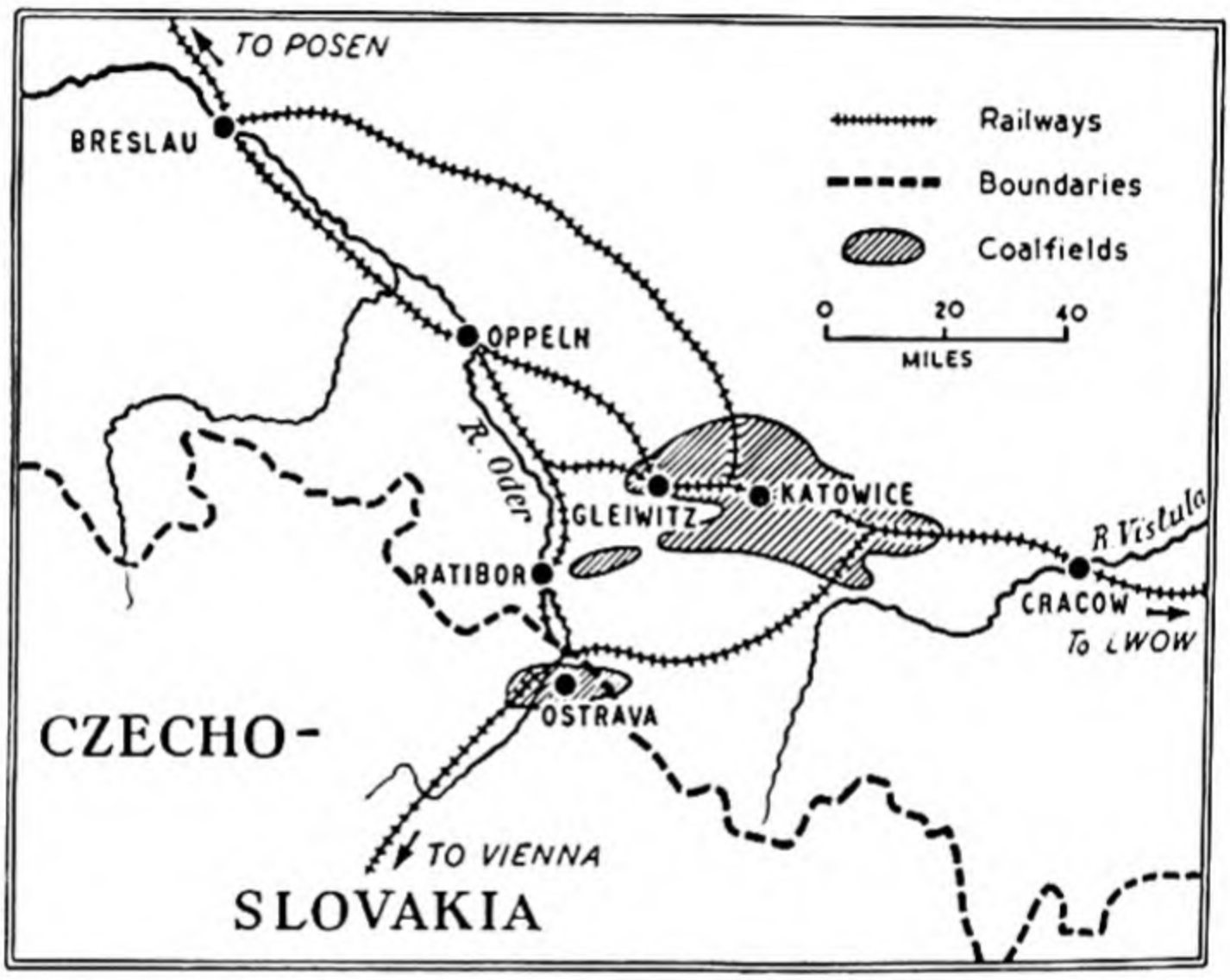


Fig. 49. THE SILESIAN COALFIELD.

and the manufacture of steel has recently come into production nearby.

Within the area recently added are the important towns of Breslau (Wroclaw), Ratibor and Gleiwitz (Gliwice). Wroclaw (400,000) is a route centre with important railway engineering works. Its restoration by 1946 has been regarded as the greatest achievement of the post-war period. More goods waggons are in use in Poland than were running before the war, and a great number of these have come from the waggon works at Wroclaw. Iron and steel industries are carried on at Ratibor and Gleiwitz.

The new frontiers have probably solved the lesser problems of pre-war years: (1) frontiers with the smaller neighbouring states of Lithuania and Czechoslovakia have been fixed; (2) the development of the eastern marshlands is now primarily the concern of the U.S.S.R.; and (3) the possession of the Danzig area removes the grievance of a trade outlet to the Baltic. No frontier changes, however, can give well-defined boundaries to east or west, or settle the religious and political differences which are fundamentally the cause of many Poles hating the new régime and being desirous of settling in other countries.

As a result of the war, Poland's pre-war population of 35,000,000 decreased by nearly 8,000,000. Then, however, agricultural Poland was rather over-populated so that farms were too small to be really efficient. While the fall in population during the war has done something to remedy this, it has produced a serious man-power shortage in Poland's rapidly expanding industry. The standard of living is still very low compared with the standards existing in Western Europe.

Poland is now a more compact and homogeneous area, and the acquisition of the western provinces with their great farming and industrial possibilities more than compensates for the surrender of the less highly-developed eastern areas despite the loss of the towns of Vilna (240,000) to Lithuania and Lemberg (Lwow, 390,000) to the Ukraine.

(4) THE CARPATHIANS.—The north-facing slopes of the Carpathians are for the most part a scantily-populated, forested area.

Trade

More than half of Poland's trade is with the Soviet bloc and about one-third is with Western Europe. Trade with Czechoslovakia and with the United Kingdom represents in each case about 8 per cent. of the total. Poland's most important export is coal—about 16 million tons a year—followed by railway rolling stock and ships. Between them, the U.S.S.R., Czechoslovakia and Eastern Germany take about three-quarters of Poland's coal exports. Sweden, in return for Polish coal, sends iron ore. Poland's main imports are iron ore, petroleum, fertilisers, wheat, cotton and wool.

CHAPTER X

THE COUNTRIES BORDERING THE BALTIC SEA: (4) GERMANY

Development: Agricultural and Industrial

After attaining national unity in 1871, Germany made such rapid strides in development that she ranked, at the outbreak of the First World War, as one of the most highly-industrialised countries of the world. Her progress was in no small measure due to her wealth of mineral deposits, particularly of coal. Many of these resources still remain, but the extent and method of their future development will proceed under some form of control. Some areas seem certain to be permanently lost, *e.g.* Silesia.

Agriculture also made great progress, but did not everywhere keep pace with the industrial development. In the western half of the German plain, the adoption of scientific methods and the liberal use of fertilisers resulted in an intensive agriculture with large yields per acre. In western Germany the average yield per acre of wheat, potatoes and sugar beet was higher than that of France, which is climatically the more favoured country.

In the eastern half of the plain (parts of which have now been taken over by Poland and by the U.S.S.R.), in consequence of the continued existence of large estates and old-fashioned methods, agriculture was less intensive and yields were lower. Rye, a poor grain, for which there is no overseas market, was extensively produced on lands which, fertilised and cultivated on scientific lines, as in Denmark or Belgium, could have produced larger and more valuable crops, or become a dairying region.

Germany before the war ranked as the first country in Europe for the production of coal (Fig. 50), metal manufactures and chemicals; second as a consumer of raw cotton, and third in respect of the total tonnage of her shipping. On the agricultural side Germany led the world as a producer of

sugar beet and potatoes; ranked second as a producer of rye; but the area developed to pasture and fodder crops was lower than might have been expected in view of the needs of her large industrial population.

The German countryside was but little touched by the war, but the great industrial cities suffered terrible devastation and much industrial plant that survived the war was removed later, either for reparations, or in an effort to eradicate all "war industries." The immediate problem after the war was to

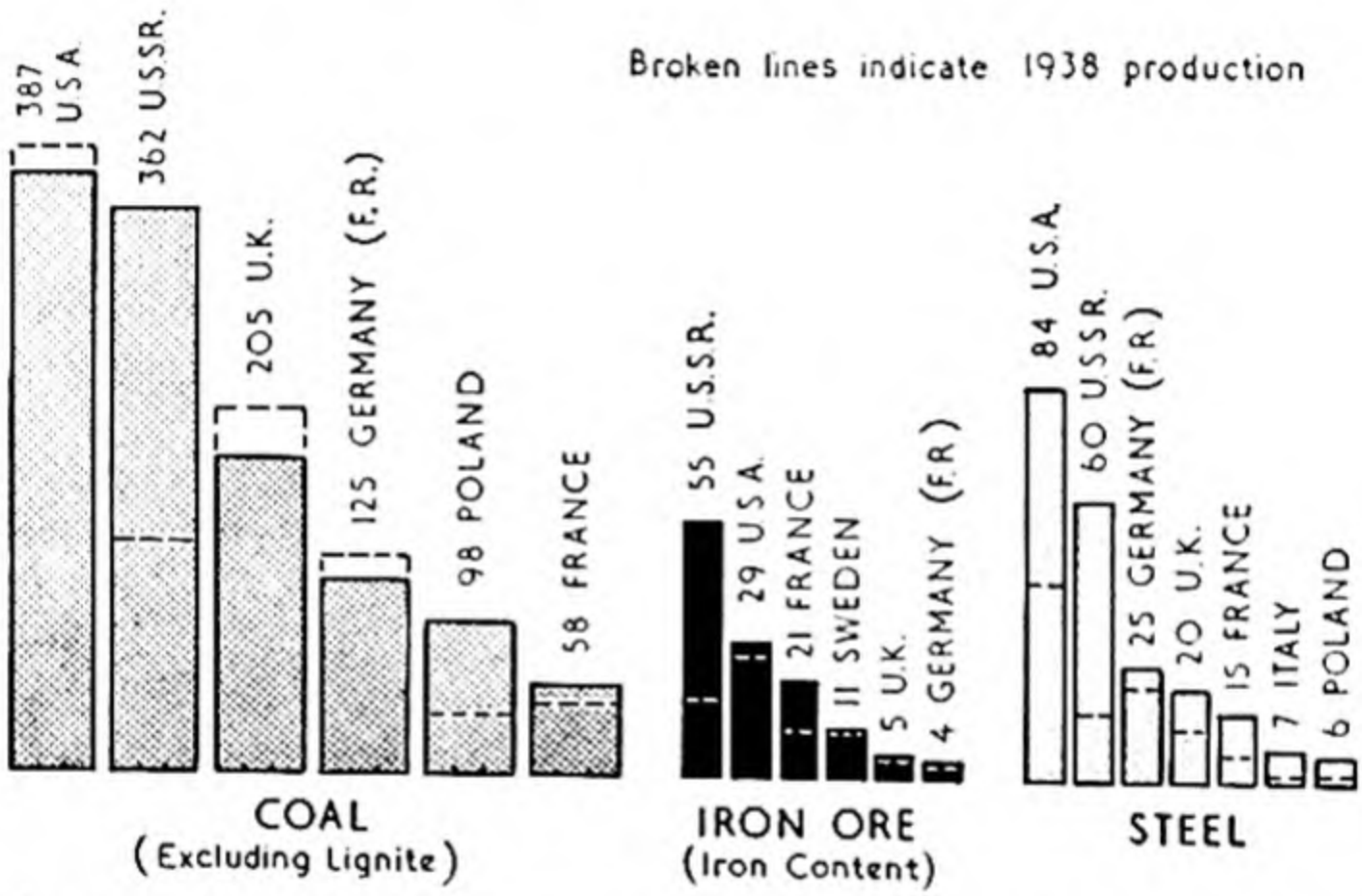


Fig. 50. THE FIGURES SHOW THE 1959 OUTPUT OF COAL, IRON ORE AND STEEL IN MILLIONS OF TONS IN THE CHIEF PRODUCING COUNTRIES OF EUROPE AND IN THE UNITED STATES OF AMERICA.

devise a scheme for the restoration of the national economy so as to make the country self-supporting and raise the deplorable standard of living in the cities.

Relief and Physical Features

Structurally Germany is made up of portions of—

(*a*) The European Plain.

(*b*) The old mountain system of Central Europe (the Hercynian system).

(*c*) The Alpine system.

Germany may therefore be divided into four major physical regions, viz.—

(1) In the north, extending from Holland to Poland, is the North German Plain.

(2) Bordering the plain on the south is a region of plateau and block mountains.

(3) In the south-west is the Rhine Rift Valley and its associated highlands, and the area of the German scarplands.

(4) In the extreme south is the Alpine zone or the Alpine foreland of Bavaria.

(1) THE NORTH GERMAN PLAIN

This extensive plain, which is of an average width of about 150 miles, may be divided into two markedly different regions, both of which owe their characteristic features to the Ice Age.

(A) In the north, in the lands bordering the Baltic Sea, is a region of morainic hills, the Baltic Heights, rising in the east to over 1,000 feet. It is a region of disordered relief, poor drainage, and usually infertile soils. In the hollows of the unevenly-distributed glacial deposits are lakes and marshes. These are most evident in the more easterly hills and continue into Poland.

(B) South of the morainic hills is what may be termed a Central Depression. Particularly in the east, it is an extremely flat and badly-drained region. In this broad plain are well-marked east to west depressions which once contained the waters of the melting ice sheets to the north (Fig. 51). These glacial channels are of importance for the way in which they permit east-to-west communication, as well as the easy linking up of rivers by canals (Fig. 52).

The rivers of the North German Plain such as the Elbe and Weser, flow diagonally from south-east to north-west. The courses of all these rivers are characterised by right-angled bends which, with their tributaries, give the drainage a " trellised " plan. For instance, the lower valley of the Weser, the valley of its tributary, the Aller, and the upper valley of the Elbe form one long depression. The peculiarities of this drainage system are due to the periodic blocking of the river

channels by the deposition of moraines during the Ice Age and the consequent diversion of the course of the streams.

Economic Development of the North German Plain

(A) The northern morainic region is almost exclusively devoted to agriculture, in spite of the fact that much of the soil is infertile and that the climate, particularly in the east, is one of extremes.

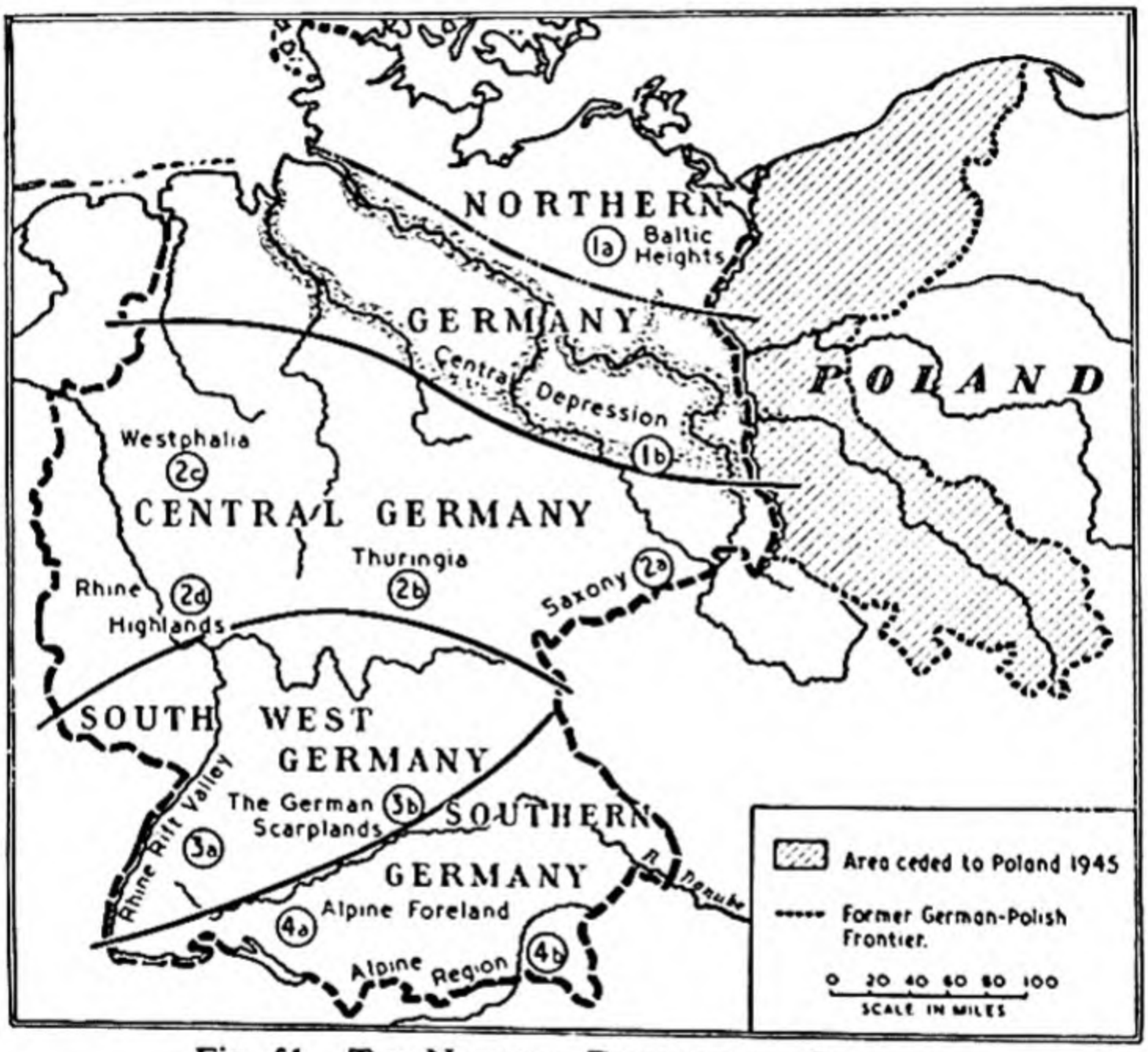


Fig. 51. THE NATURAL DIVISIONS OF GERMANY.

The most productive region is Schleswig-Holstein, which is noted for pig-rearing and which, in its agricultural outlook and development, is very similar to Denmark. The productiveness of the plain decreases eastwards, the least developed lands lying within the area at present administered by the U.S.S.R.

The chief crops of the north are potatoes and rye. The former crop is used for feeding pigs, for the distillation of

alcohol, and for the manufacture of starch, while the latter is an important item in the diet of the peasant population. The number of cattle per square mile was never more than 50 per cent. of that of Denmark, but it is possible that this region may have an important future as a dairying region if it is developed along Danish lines.

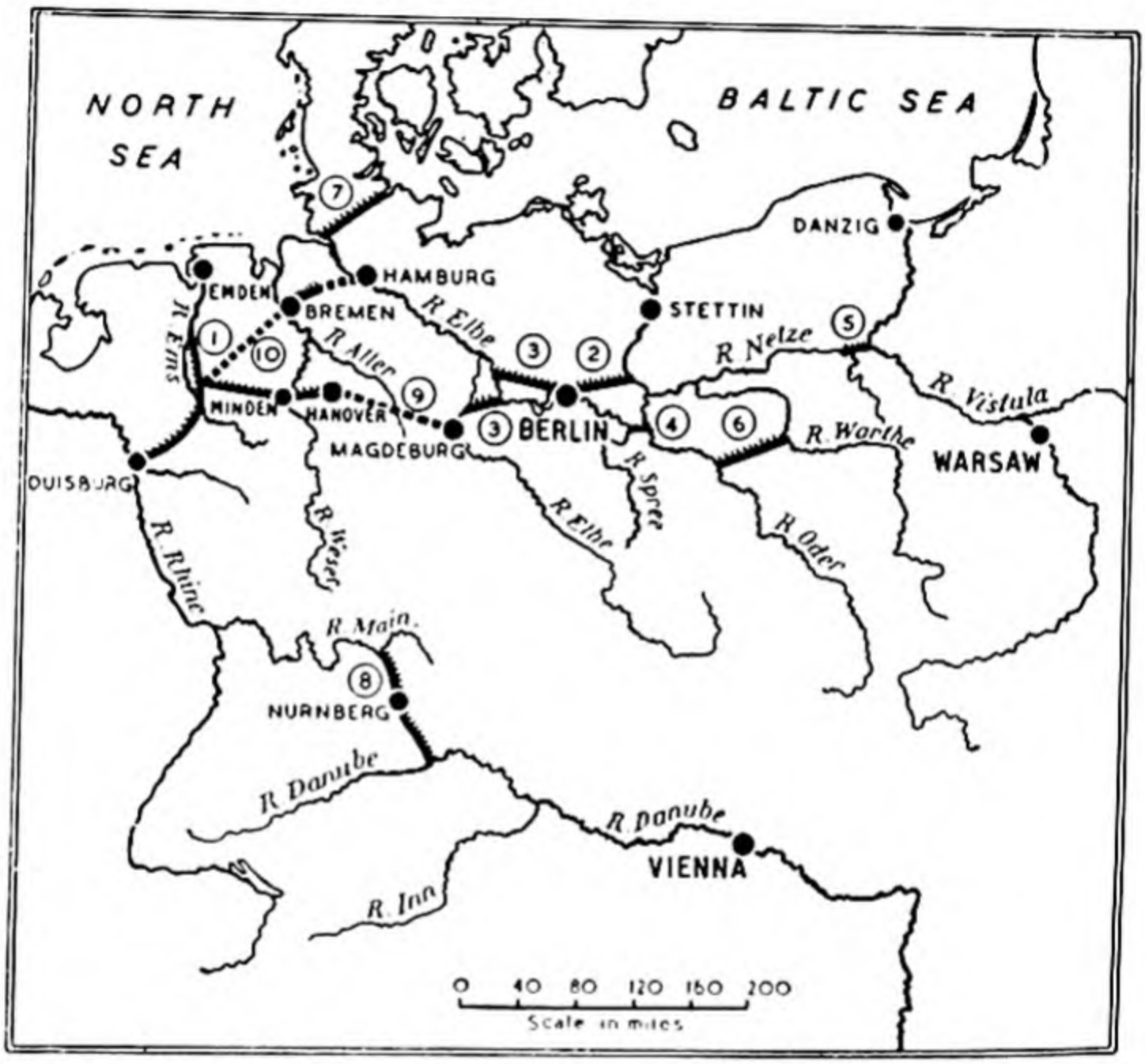


Fig. 52. WATERWAYS OF GERMANY, POLAND AND AUSTRIA.—1. Dortmund-Ems Canal. 2. Finow Canal. 3. Havel-Spree canalised rivers. 4. Frederick William Canal. 5. Bromberg Canal (now in Poland). 6. Oder-Warthe Canal. 7. Kiel Canal. 8. Ludwigs Canal. 9. Weser-Elbe Canal, opened in Oct., 1938, completes the "Mittelland Kanal" across Germany from west to east. 10. Proposed Hansa Canal to give direct water communication from Ruhr Coalfield to Bremen and Hamburg.

The chief towns of the north are the seaports. In the west the coast is indented by long narrow openings, known as "förden," which make good harbours. In the east the coast is of the sand-dune type, with shallow haffs almost completely cut off from the sea by sand-bars or "nehrungs." Because the Baltic is a partially-enclosed sea, and because the

harbours are frozen for varying periods during the winter, the ports are of second-rate importance Most of the export trade of their hinterlands finds its way north-westwards to the North Sea outlet at Hamburg. The chief ports are Kiel, the German naval station at the eastern end of the Kiel Canal; and Lübeck, controlling an easy route south-westward to Hamburg and, in the Middle Ages, the chief port of the Hanseatic League. It is situated on the River Trave which was linked to the Elbe by a canal, and before the rise of the great Atlantic routes and the North Sea ports, was a main centre of exchange in the Baltic trade carried on by the League.

(B) South of the morainic hills, the Central Depression is also a region of relatively low agricultural value. In the east, in the province of Brandenburg, swamp and forest occupy much of the surface, and in the west, in Hanover, there are large areas of sandy soil, *e.g.* the Lüneberger Heath (see plate facing page 112), a region similar to the Dutch "geest" land. Rye is the chief cereal crop. Much has been done towards the reclamation and the fertilisation of the sandy areas on lines similar to those followed in Holland. The most productive region is in East Friesland, where there are fertile polder lands.

The outstanding value of the Central Depression is its importance as a highway. It is the natural line of routes from the south-east to the northern seaports, especially Hamburg. A feature of its communications are canals which, because of the absence of highland, are easy to construct (Fig. 52). Canals link the Vistula to the Oder, the Oder to the Havel-Spree, and the Havel-Spree to the Elbe. Plans for further expansion of the system have been formulated but there may now be considerable delay before they are fulfilled. The Mittelland Kanal gives a through water route from the Vistula to the Weser and Rhine. The Hansa Canal will give an all-water route between the Westphalian coalfield and Hamburg. This may have the effect of increasing the importance of Hamburg at the expense of Rotterdam. It should be noted, however, that the Dortmund-Ems Canal did not divert traffic to the extent anticipated, despite special concessions granted to German traders using the route.

Berlin (2,200,000), like other European cities, such as Madrid and Leningrad, owes its growth primarily to historical events.

The original site of the town was an island in the River Spree where the waterways and surrounding swamps made it suitable for defence. It was the capital city of the princes of Brandenburg, later the Kings of Prussia. When Prussia took the lead in Germany, Berlin was made the capital of the country in spite of the fact that it is not centrally situated, nor in the region of greatest natural wealth. Roads, railways and canals were built to link Berlin with all parts of the country so that it became the great route-centre of the country. Like all other

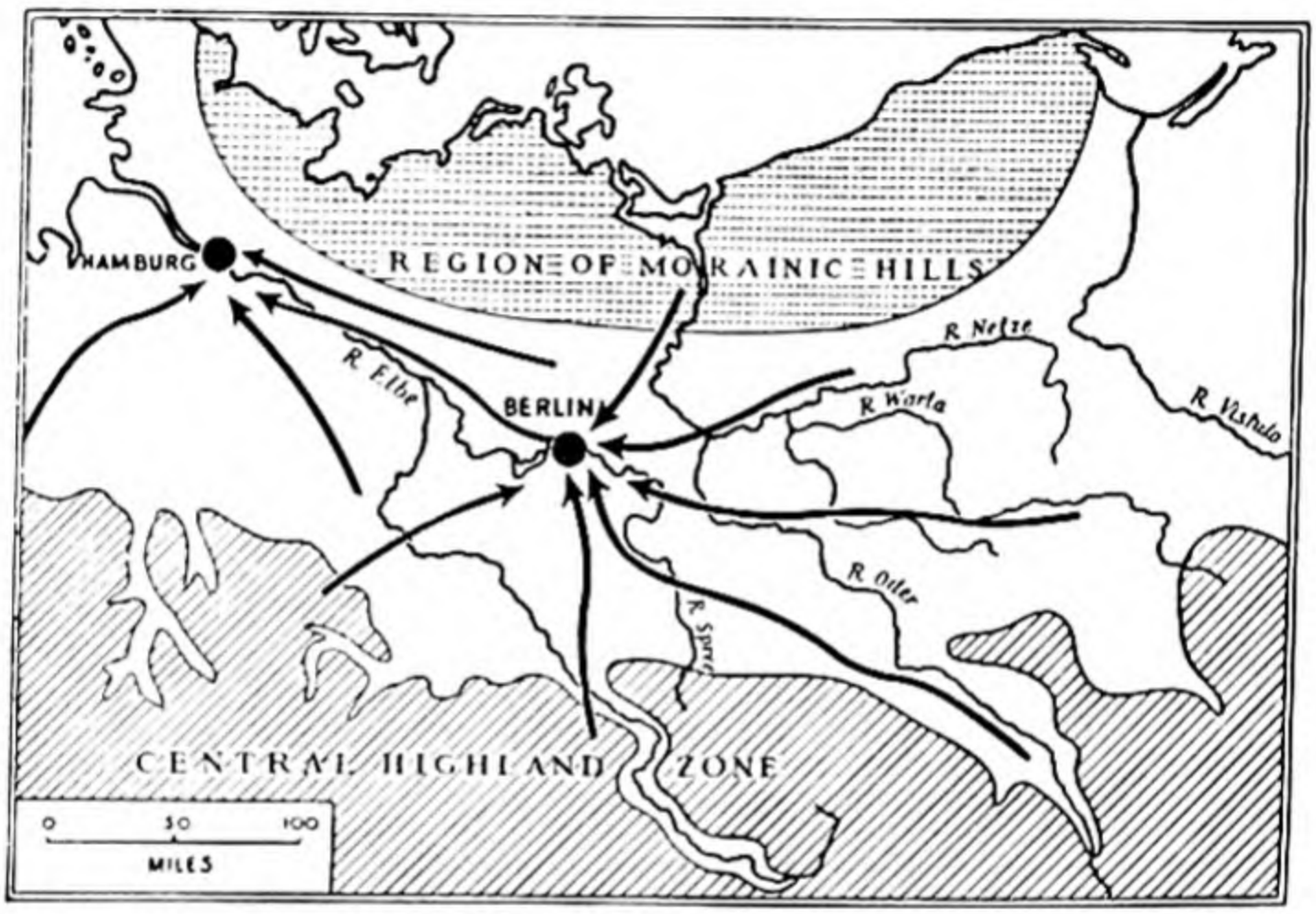


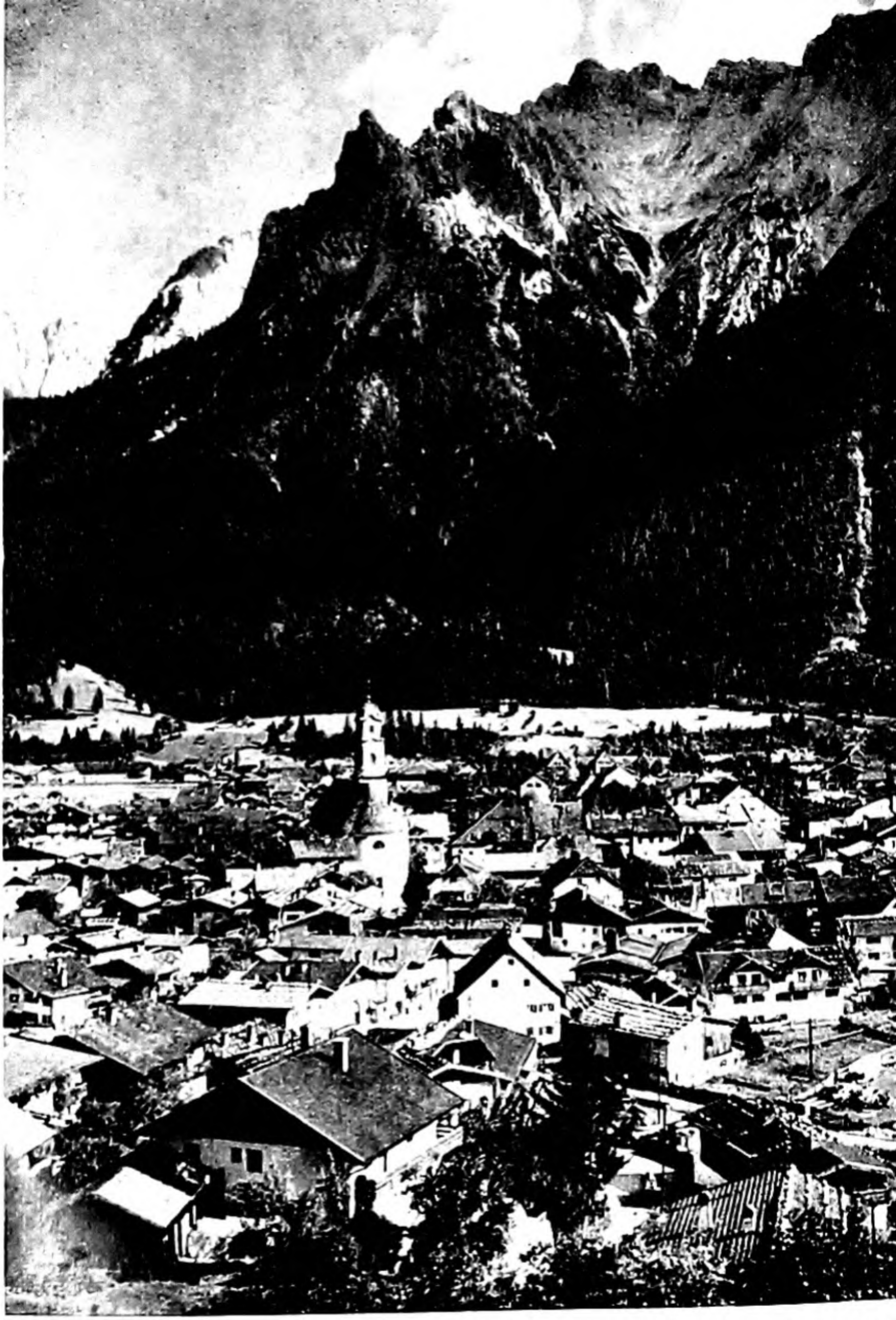
Fig. 53. THE POSITIONS OF BERLIN AND HAMBURG IN RELATION TO THE ROUTES OF CENTRAL GERMANY.

capital cities, it has a large number of industries including printing, the manufacture of clothing, and furniture and electrical trades.

Hamburg (1,800,000), at the lowest bridging point of the Elbe, is the greatest port, but considerable damage has been done by air bombardments. Like Rotterdam and Amsterdam it is a great entrepôt, for it serves not only Germany but many regions beyond. For instance, before 1939 over 50 per cent. of the overseas trade of Czechoslovakia used to pass through Hamburg. It has direct communication (*a*) south-east, via the Elbe valley to Eastern Germany and the Danube countries,

Above Lüneberg Heath. There are extensive areas of very sandy soil on the North German plain, unfit for agriculture except by expensive reclamation, and still largely heath land, often with coniferous trees. Similar areas occur in the "geestlands" of Eastern Holland and Western Denmark. (*German Tourist Information Bureau.*)

Below The Rhine Gorge near Boppard. Note the barge traffic and the way in which roads and railway follow the river. Notice also the situation of the village. (*German Tourist Information Bureau.*)



Mittenwald in the Bavarian Alps. Note the flat valley floor, the steep valley wall with forested lower slopes, the cirque, and the waterfall. (*German Tourist Information Bure*

(*b*) north-east via a natural depression to Lübeck, (*c*) water communications via the Kiel Canal to the Baltic Sea, (*d*) south-westward across the plains to the Westphalian industrial area. Ultimately the Ems-Weser and Hansa Canals will give direct water communication with the industrial centre of the Ruhr valley. It has huge shipbuilding yards and industries dependent upon imported raw material, *e.g.* flour milling, soap making and oil-refining. Cuxhaven, some sixty miles downstream, is the outport of Hamburg.

Bremen (500,000), the port of the River Weser, is essentially the outlet for the trade of Western Germany. The absence of waterways linking it with Eastern Germany gives it a more restricted hinterland than Hamburg serves. Raw materials from America, such as cotton, figured prominently in the imports until 1939. To accommodate the larger modern vessels Bremerhaven has developed as an outport.

Wilhelmshaven, situated on Jade Bay, is a naval station.

(2) CENTRAL GERMANY

Where the northern plains of Germany meet the Central Highlands is the richest and most highly-developed region of the country. This region of dense settlement extends in a line from the Rhine to Saxony. Not only are there large coalfields (see Fig. 21) and extensive mineral deposits, which have given rise to manufacturing industries, but also some of the most productive farmlands in the country. Scientific agriculture has resulted in high yields of wheat, oats, barley, sugar beet, and dairy produce. One of the most favoured agricultural regions is the area between the Weser and the Elbe in the neighbourhood of Magdeburg. Here are rich loamy soils devoted especially to the cultivation of sugar beet and wheat, in rotation with other crops. Two-thirds of the German crop of sugar beet is produced in this region. The principal towns, *e.g.* Magdeburg, on the Elbe, Hanover on the R. Leine, and Brunswick on the R. Ocker, are all similarly situated. Each lies on the route skirting the highlands, at a point where a river valley leads southwards. Many industries, based largely upon the agricultural products of the region, have arisen, especially flour milling, sugar refining, brewing and distilling.

Divisions of Central Germany

The chief subdivisions of Central Germany are—

(A) Saxony.

(B) The mineral district on the borders of the Harz Mountains.

(C) Westphalia.

(D) The Rhine Highlands and the Rhine Gorge.

(A) SAXONY.—The industrial district of Saxony lies on the northern slopes of the Erz Gebirge (Ore Mountains). Because

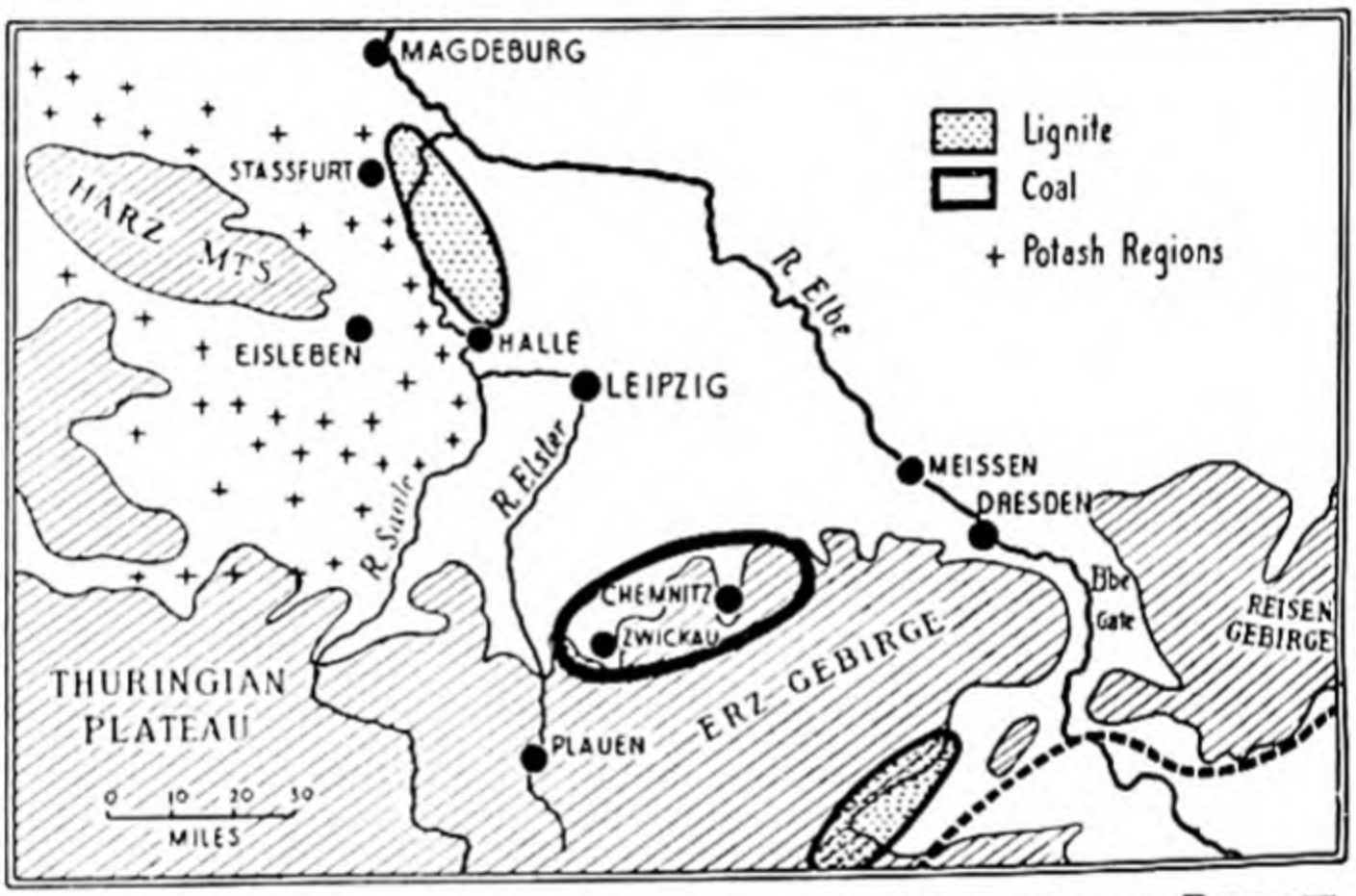


Fig. 54. THE SAXONY COALFIELD AND THE STASSFURT POTASH DISTRICT.

of the mineral ores and sheep pastures of the mountains, this region has been noted for many centuries for its working of metals and weaving of wool. Thus there developed a traditional skill in manufacturing, which is the real basis of the modern industrial development of the region. The coal output is small, less than 4 per cent. of the output for the whole country, but there are large supplies of lignite (brown coal), which is burned in power houses for the generation of electricity. The region produces the greater part of the textile manufactures of Germany, and there is a large variety of other industries, viz. pottery (Meissen), glass, chemicals, leather, clothing, etc. Because it is remote from the sea and the

supplies of raw materials, there is a tendency to specialise in the manufacture of articles requiring much skill and little raw material, viz. precise scientific and optical instruments, musical instruments (Leipzig), etc. (cf. Switzerland, page 130).

The chief industrial towns of the hill slopes are Chemnitz, Plauen and Zwickau (Fig. 54).

Dresden (500,000), on the Elbe, controlling the Elbe Gate, a narrow valley leading to Bohemia, is the chief route centre. It is also a tourist centre for the mountain region to the south and is the regional capital of Saxony.

Leipzig (600,000), like Dresden, has contact both with hill and plain country and is a great route centre and market town. Its nodal position in the communication system of southern Germany accounts for the success of the trade fairs which used to be held annually and attracted buyers from all parts of the world.

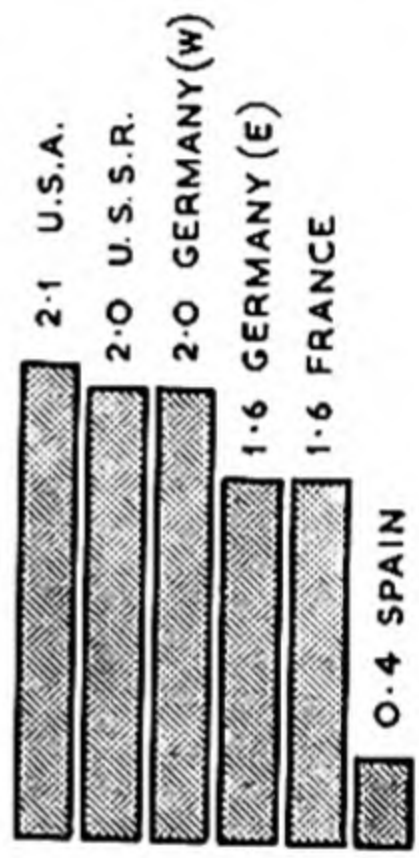


Fig. 55. WORLD PRODUCTION OF POTASH IN MILLIONS OF TONS, 1958.

(B) THURINGIA.—This region lies to the north-west of Saxony, and comprises the district immediately north of the Harz Mountains and part of the Thuringian plateau (Fig. 54). There are large quantities of lignite found in the neighbourhood of Halle, but the real basis of the industrial development of this district lies in the vast deposits of potash in the neighbourhood of Strassfurt. These constitute one of the largest reserves of potash in the world (Fig. 55). Their importance is threefold—

(*a*) As fertilisers, for which purpose they are almost indispensable to modern intensive agriculture.

(*b*) As raw materials for certain manufacturing industries, viz. soap, glass, explosives, and dyes.

(*c*) As an important source of return cargo for ships which bring in raw materials (cf. coal and salt in England).

(C) WESTPHALIA.—On the northern edge of the Rhine Highlands, in Westphalia, lies the Ruhr coalfields (Fig. 56), by

far the most highly-industrialised area of Germany. Consequently this region received enormous damage during the war. The restoration of the normal life of this industrial area has been considered by many to be the key to the recovery of western Europe, for not only Germany but all the neighbouring countries depend to some extent upon the prosperity of the Ruhr.

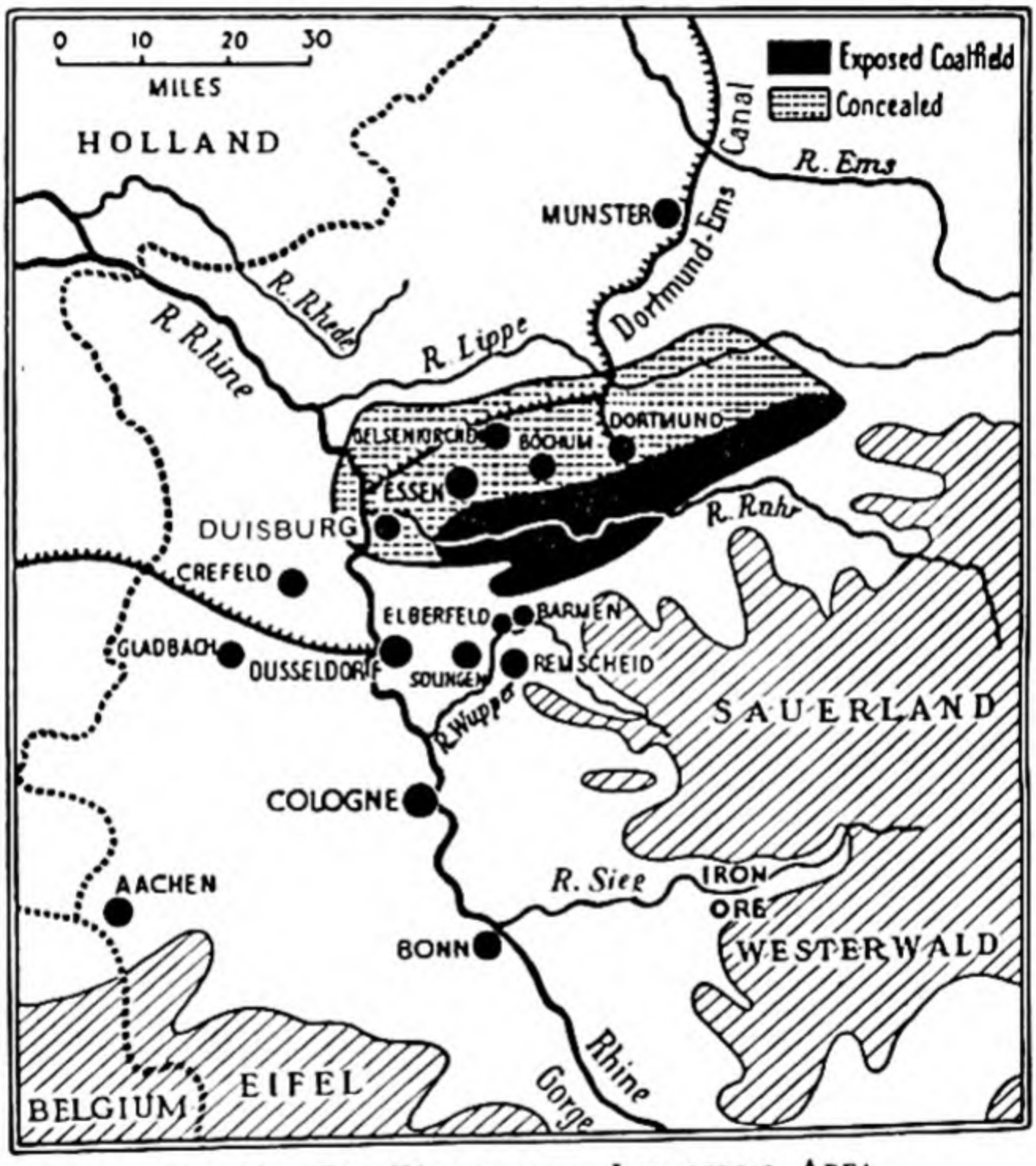


Fig. 56. THE WESTPHALIAN INDUSTRIAL AREA.

Normally this coalfield produces about three-quarters of the total output of German coal. As in many English coalfields, there is both an exposed and a concealed coalfield (Fig. 57). The coal measures are exposed in the Ruhr valley, but dip northwards under the newer rocks, so that coal mining on the concealed coalfield extends nearly as far north as the River Lippe. Not only are the coal reserves extensive and

easy to work, but there is a variety of types of coal, including good coking coal. The area came within the British zone of Germany for administrative purposes. Industrial revival immediately after the War was delayed by political differences amongst the occupying powers, but later great efforts were made to restore coal output to pre-war level. It is, however, only necessary to review the main groups of industries which flourish in this area in order to realise the vast potential resources of the area. Four great classes of industry sprang up in the region:—

(*a*) The smelting of iron ore and the manufacture of iron and steel goods. The towns of the Ruhr valley itself, *e.g.* Essen (725,000), Dortmund (600,000), are primarily concerned with this industry. Most of the iron used is obtained from

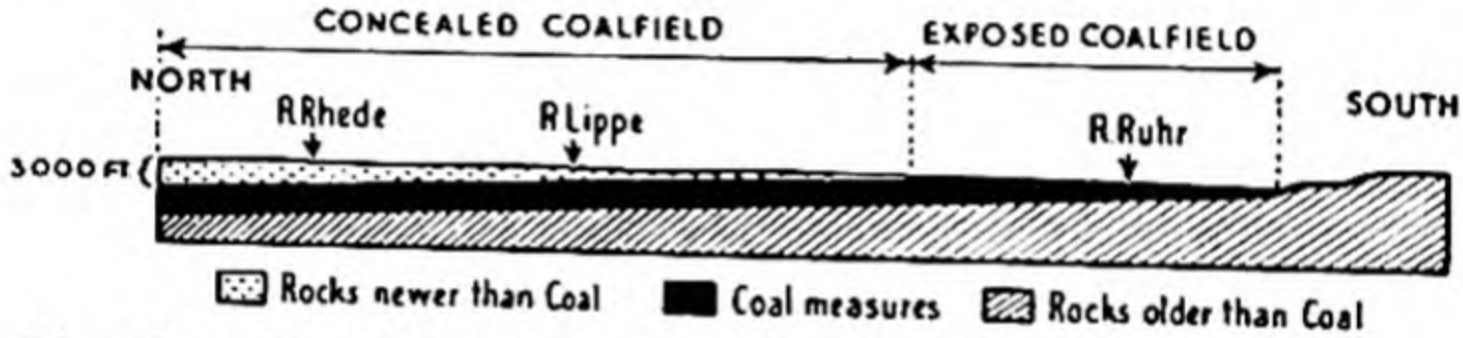


Fig. 57. Diagram to Show the Exposed and Hidden Coalfield of Westphalia.

Lorraine (see page 50). The pre-war total production of pig-iron and steel in this one industrial area of Germany alone exceeded the total output for the whole of Great Britain.

(*b*) Immediately to the south of the Ruhr, in the valley of the River Wupper, textiles are manufactured. The industry dates back to the old woollen industries based on local supplies of wool and water-power. Subsequently cotton and rayon mills arose at such centres as the twin cities Barmen and Elberfeld, now one municipality called Wuppertal (400,000).

(*c*) Still farther south, at Solingen (160,000) and Remscheid, another metal-working region arose, specialising in cutlery. This industry owed its origin to the iron ores of the Westerwald Mountains.

(*d*) To the west of the Rhine, a second group of textile centres grew up such as Aachen, noted for woollens; Krefeld (200,000), the centre of the German silk manufacturing

industry, and München-Gladbach (cotton), sometimes called the "Manchester" of Germany.

As would be expected, there are important towns on the Rhine which act as river ports for this vast industrial area.

Dusseldorf (700,000) is the river port for the textile centres of Barmen-Elberfeld to the east and the cotton manufactures of München-Gladbach to the west. It is also the commercial centre for the whole of the Westphalian industrial zone.

Duisburg (475,000), at the confluence of the Ruhr and Rhine, is the river port for the Ruhr valley, and handles a greater volume of merchandise than either Rotterdam or Antwerp.

Fig. 58. THE TOWNS OF THE RHINE GORGE.

Cologne (780,000), situated where the river leaves the hills for the plains, is of Roman origin (Lat. *Colonia*), and owes its importance to its control of routes, (1) along the Rhine valley, and (2) east and west along the northern edge of the Highlands. It is therefore a natural focus of routes, and is the fourth city of Germany. Its industries are mainly of the "luxury" type, *e.g.* perfumes.

(D) THE RHINE HIGHLANDS AND THE RHINE GORGE.—This section of Central Germany consists of the Highlands immediately to the south of the industrial zone. They include the Rhine Highlands, and also a complicated mass which extends eastwards towards Saxony. The Rhine Highlands are a dissected plateau, divided by the valleys of the rivers

Rhine, Moselle and Lahn, into four blocks, viz. the Eifel, Westerwald, Hunsrück and Taunus. These uplands, largely composed of forested and moorland areas, are scantily populated. There is little mineral wealth except the iron ores of Westerwald, and the building stones and road metal from the volcanic areas of the Eifel. The river valleys contrast sharply with the plateau. The Rhine and the Moselle have cut deep valleys, and the mountain slopes drop so steeply to the river that the construction of roads and railways is difficult (see plate facing page 113). The Rhine Gorge, extending from Bingen to Bonn, is one of the most picturesque portions of the Rhine valley. Sheer cliffs are crowned by the famous Rhineland castles, and the hill slopes are either richly forested or terraced with vineyards and orchards of cherry trees. The Rhine itself, dredged and deepened, is a busy thoroughfare for water traffic. Wherever there is a sufficient width of lowland between the river and the plateau edge, towns have developed. The chief town of the Rhine Gorge is Coblenz (Lat. *Confluens*) situated at the confluence of the Moselle and the Rhine (Fig. 58). On the opposite bank the Rhine is joined by the River Lahn, so that Coblenz is a great natural "cross roads" in a region of difficult communications.

East of the Rhine Highlands the ancient mountains of the Hercynian system extend towards Saxony, forming a barrier between northern and southern Germany. In general, these Highlands, like those of the Rhineland, are regions of forest and moorland separated by fertile cultivated valleys. Of outstanding importance are two well-marked north to south routes which skirt the volcanic mass of the Vogelsberg on the east and west. Throughout history these two routes have linked the plains of Hanover with the middle Rhine. It is to its position at the south end of these routes, linking the fertile Rhine valley with North Germany, that Frankfurt-on-Main (660,000) owes both its past and present importance.

(3) SOUTH-WEST GERMANY

South-West Germany consists of two different areas—

(A) The Rift Valley of the middle Rhine.

(B) The German Scarplands.

(A) THE RHINE RIFT VALLEY.—The rift valley of the Rhine extends from Basel to Bingen. In this section of its course the river flows through a deep trough averaging some twenty miles in width (Fig. 59). This is the Rhine rift valley, set between the Vosges and Hardt mountains on the west and the Black Forest and the highlands of Odenwald on the east. Except for the often swampy and forested belt along the river, the soils of the valley are deep and fertile.

The Rhine rift valley is important both for its agriculture and its relation to the main highways of Europe.

Climatically, this region has somewhat less rainfall and higher summer temperatures than the surrounding regions. This is the result of its southerly position, low altitude, and the sheltering effect of the surrounding highlands. The type

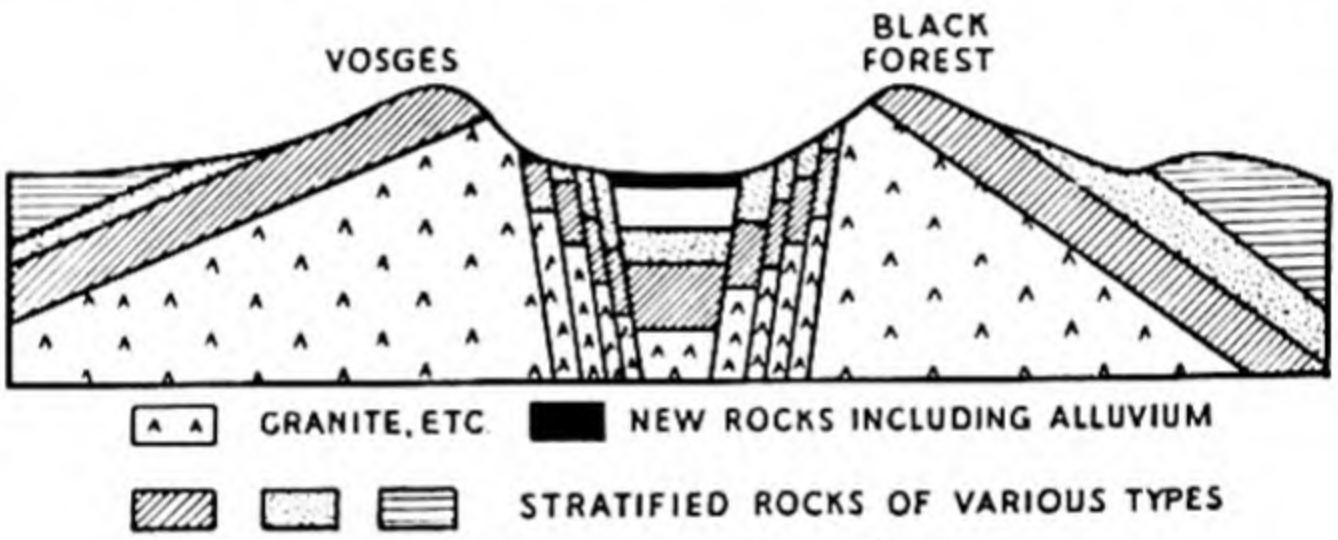


Fig. 59. SECTION OF THE RHINE RIFT VALLEY.

of agriculture and principal crops, therefore, contrast sharply with those of the other agricultural regions of Germany. Instead of the rye, oats and potatoes of Northern Germany here are rich vineyards and orchards, and productive fields of hops, tobacco, sugar-beet and wheat. Without exception it is the richest agricultural region of Germany.

As a natural highway the Rhine rift valley is unparalleled in Europe, and most of the large cities are primarily important as route centres.

The chief natural routes are:—

(*a*) Southwards via Basel to Switzerland and Italy.

(*b*) Southwards via the Burgundian Gate between the Vosges and Jura Mountains to the Rhone valley and Marseilles.

(*c*) Westwards to Paris via the Saverne Gate, a low pass at the northern end of the Vosges.

(*d*) Northwards via the Rhine valley to Westphalia and the North Sea.

(*e*) North via Frankfurt to North Germany and Berlin.

(*f*) Eastwards round the northern end of the Black Forest via Stuttgart to Vienna and the Danubian lands.

The French city of Strassbourg and the German town of Kehl, on the opposite bank, lie at the crossing of the great north-to-south highway of the Rhone-Rhine valleys, and the great east-to-west route of the Orient Express between Paris and Constantinople.

The Highlands surrounding the Rhine rift valley are still extensively forested. The valleys are cultivated, but the peasants have developed a number of domestic industries, *e.g.* wood carving, watch making and weaving, in addition to their agricultural activities.

Except for the large river ports such as Mannheim (305,000), at the Neckar confluence, and Mainz (at the Main confluence) most of the larger towns of the rift valley are situated away from the river flats and lie along the foot of the hills where they act as market centres for both the hill and valley country, *e.g.* Karlsruhe, Heidelberg and Darmstadt.

West of the Rhine rift valley in the basin of the River Saar (a tributary of the Moselle) is an important coalfield. This coalfield, in the possession of France from 1920 to 1935, became German territory following a plebiscite taken in 1935. The Saar was autonomous from 1947 to 1956, but is now once more part of Germany. It has large reserves of coal and is near the iron deposits of Lorraine, hence it is an important industrial region, with manufactures of iron and steel, glass, and paper. The chief towns are Saarbrücken (120,000) and Saarlouis.

(B) THE GERMAN SCARPLANDS.—East of the Rhine rift valley is a triangular area of varied relief bounded on the south by the Alps and the Upper Rhine, on the east by the Bohemian and Thuringian Forests, and on the west by the Black Forest (see plate facing page 128). The whole region is bisected by a scarped ridge, known as the Swabian and Franconian Jura, which runs from SW. to NE. This ridge, steepest on the NW. side, is composed of Jurassic rock (cf. the Cotswolds of England) and varies from 2,000 feet in height in the NE. to nearly 3,000 feet in the SW.

The basins of the Neckar and Main consist of forested ridges alternating with fertile vales. The region is rich agriculturally. Grapes, hops, fruits and cereals are cultivated, while such industries as leather manufactures, wood carving and weaving are carried on at many centres.

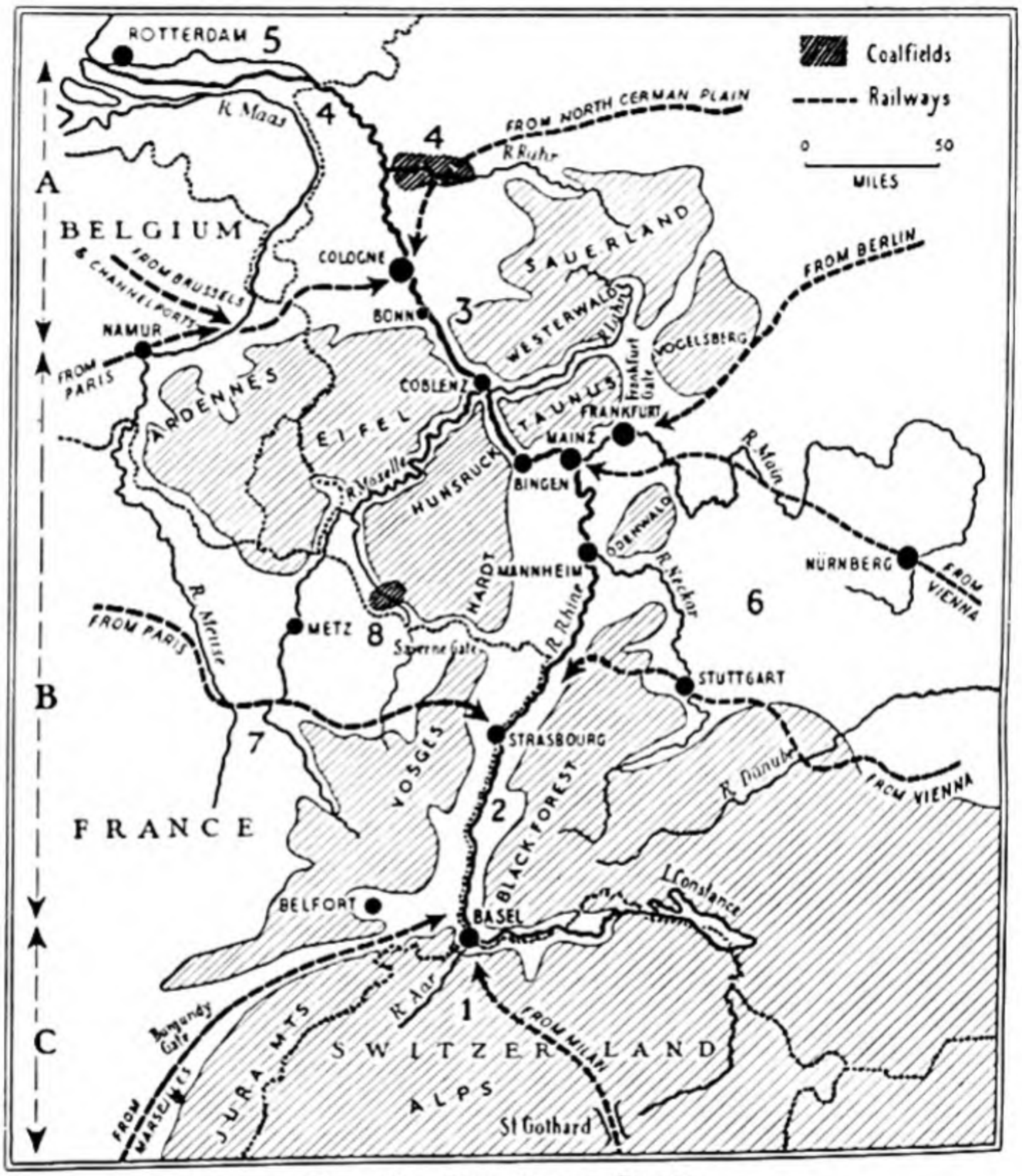


Fig. 60. THE RHINE BASIN.

A. THE LOWLAND REGION: 4. The German section of the Rhine lowlands. 5. The Deltaic area, *i.e.* the Dutch section of the Rhine Basin.

B. THE REGION OF BLOCKS AND BASINS: 2. The Rhine Rift Valley and surrounding hills. 3. The Rhine Gorge and surrounding plateaux. 6. The Scarpland Regions of the Neckar and Main Valleys. 7. The Upper Meuse and Moselle Valleys. 8. The Saar Basin.

C. THE ALPINE REGION: 1. The Swiss Alps, and the Swiss plateau and the Jura Mountains.

Nürnberg (450,000), on the Upper Main, controlling an easy route across the Franconian Jura to the Danube, is the greatest city of the region and was the scene of the memorable trial of the German war leaders. It is famous for its manufacture of toys, watches and scientific instruments.

Stuttgart (600,000), on the Upper Neckar, controls a route across the Swabian Jura to Ulm on the Upper Danube. Like Nürnberg, its manufactures are mainly those which require much skill and little raw material, viz. pianos, clocks, watches and scientific instruments.

The Rhine Basin

It is customary to think of the Rhine as a German river, but, actually, its basin is shared by four countries, viz. Switzerland, France, Germany and Holland. It is therefore impossible to give a complete description of the Rhine basin without much repetition. On the accompanying diagram of the Rhine (Fig. 60) the chief natural divisions are indicated by numbers. In the following summary references are given, which should make possible a fairly detailed description of the Rhine basin.

The Rhine basin may be divided into the following natural units.

(1) From the source to Basel (see Switzerland, page 134).
(2) From Basel to Bingen—the rift valley section (see page 120).
(3) From Bingen to Bonn—the gorge section (see page 119).
(4) From Bonn to the Dutch frontier including the Westphalian coalfield (see page 115-18).
(5) The Deltaic area (see Holland, page 66).
(6) The Basins of the Neckar and Main (see page 122).
(7) The Upper Moselle valley and the Vosges (see page 50).
(8) The Saar Basin and coalfield (see page 121).

(4) THE ALPINE LANDS OF GERMANY

The Alpine lands of Germany may be divided into—

(A) The Alpine Foreland, and (B) The Alpine Ranges.

(A) THE ALPINE FORELAND OF GERMANY forms the region known as Bavaria. This comprises the basin of the Upper

Danube and in the west the lands in the vicinity of Lake Constance. This southern district of Germany is a region of poor morainic soils often very pebbly in composition. The climate is severe because of its continental position and so it is not rich agriculturally, and pastoral farming predominates. Rye, oats, barley and hops are grown in the more favoured regions.

The swift flowing tributaries of the Danube, viz. the Isar and Inn, are used for the generation of hydro-electricity, and this is the chief source of power for the industries of *Munich*. This city, situated on the River Isar, is the regional capital of

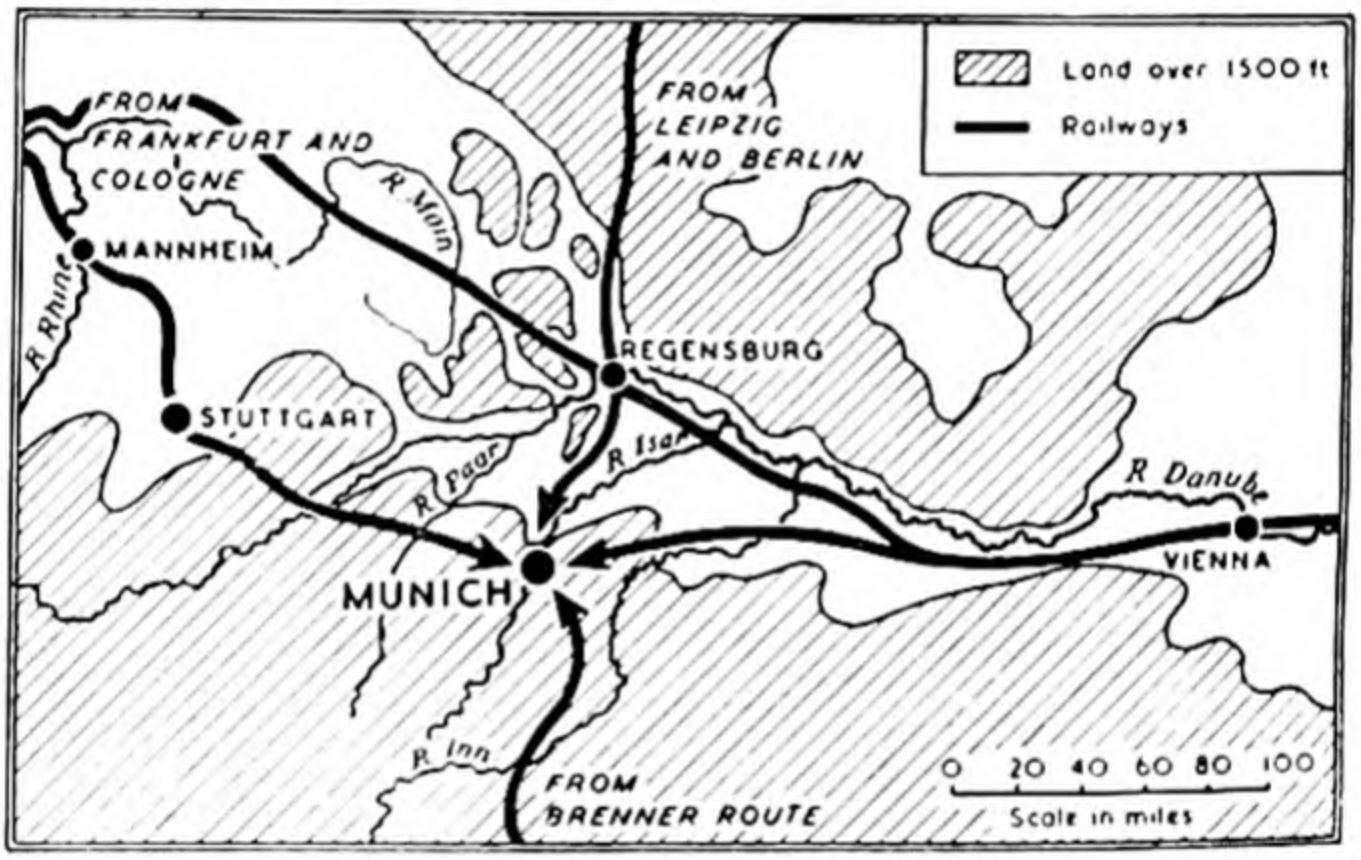


Fig. 60 (*a*). THE POSITION OF MUNICH IN RELATION TO THE ROUTES OF SOUTHERN GERMANY.

Bavaria and the second city of Germany, with a population of 1,065,000. It is noted for its brewing industry and for a variety of other manufactures such as pottery and glass. It is the great route centre of southern Germany and lies on the Orient Express route which in this part of Europe links the Middle Rhine lands with Vienna.

Friedrichshafen, on the north shore of Lake Constance, is an important centre of the aircraft industry.

Ratisbon (Regensburg) is situated at the northerly bend of the Danube and controls the route northwards across the Franconian Jura to Nürnberg.

(B) THE ALPINE RANGES.—The narrow band of the Alps within Bavaria is a region of picturesque but rugged scenery. Oberammergau, famous for its "Passion" play, is a well-known tourist centre. Farther east, in the district of lakes (Walchensee and Kochelsee), a large hydro-electric power station has been constructed.

POST-WAR CHANGES

After her defeat by the Allies in 1945, Germany lost part of East Prussia to the U.S.S.R. and the remainder, including Dantzig, to Poland. In addition, she lost to Poland those parts of Pomerania and Silesia east of the line of the Rivers Oder and Neisse [see Fig. 47 (*a*)]. The Saar area, although an independent republic from 1947-56, is now reunited with Germany.

The whole of Germany was occupied by the Allies, Eastern Germany as far west as approximately 10° E. by the U.S.S.R. The larger part of the city of Berlin, however, was under western control, with somewhat tenuous transit rights by rail, road, river and air across the Eastern or Soviet Zone. In Eastern Germany there has been set up a Communist government, the "German Democratic Republic," part of the Soviet bloc (see page 271). The "Iron Curtain" now runs along the western boundary of the German Democratic Republic.

The Zones formerly occupied by the U.S.A., France and the United Kingdom form the Federal German Republic with its capital at Bonn. The Federal Republic has now gained its independence and is one of the North Atlantic Treaty Organisation powers.

At the end of the war Germany was in desperate economic straits. She had lost to Poland much good farm land (which before the war had an agricultural surplus) and some industrial areas; her towns and industrial installations had been heavily damaged by bombing, and much of her industrial plant was taken as reparations. Population in the Eastern Zone was swollen to a total of 17 millions by about 4 million refugees from areas ceded to Poland and the U.S.S.R., and in the Western Zones to a total of 49 millions (25 per cent. more than pre-war) by over 8 million refugees from communism. (Refugees from Eastern Europe are still entering the Federal

Republic at the rate of 120,000 a year.) All Germans look forward to the time when the Eastern and Western Zones will be reunited, but under present political conditions this may not be for some time.

Fig. 60 (*b*).

Before the war, what are now two separate States were, from the economic point of view, to a considerable extent complementary. Thus Eastern Germany had a food surplus, but, being short of industrial raw materials, imported from the

Ruhr much of the steel and coal needed for its light industries. Although there is little coal, Eastern Germany is the largest producer in the world of lignite, her annual output of over 200 million tons being equivalent to about 70 million tons of ordinary coal in heating power. It is, however, less convenient to use than ordinary coal and is best used for the generation of electricity in power stations equipped with specially designed furnaces.

In the Democratic Republic large new steel plants have been built at Fürstenberg and at Calbe and crude steel production (3 million tons) is greater than pre-war. There is now a flourishing chemical industry based on the brown coal of the Halle-Leipzig field and local raw materials such as potash and anhydrite. The principal products are plastics, aluminium, synthetic rubber (80,000 tons a year) and fertilisers. Agriculture has not made the same progress and living standards are considerably lower than in Western Germany.

On the other hand, Western Germany, the Federal Republic, has made a spectacular recovery. Production in almost all fields is greater, and in most cases much greater, than pre-war. Overall industrial production has risen to well over twice that of 1936. In 1956, for example, more motor-cars were manufactured in Western Germany than in Britain. Moreover, since the war many of the firms engaged in light engineering in Saxony have started up in Western Germany, *e.g.* the manufacture of scientific and optical apparatus.

As a trading nation Western Germany ranks third, after the United States and the United Kingdom, but well ahead of the fourth, Canada. As an *exporter* Germany ranked second in 1959 ahead of the United Kingdom. Nearly half Germany's imports are raw materials, including cotton, wool, and jute, iron ore and non-ferrous ores, rubber, petroleum and wood; and more than one-quarter are foodstuffs such as wheat, fruit, coffee and eggs. Over 90 per cent. of Germany's exports are manufactured articles and include machinery, cars, and ships, iron and steel goods, chemicals (including fertilisers), textiles, scientific instruments and watches.

Thus Western Germany, like Britain, cannot feed her population herself and has to import food and raw materials, for which she pays by exporting manufactured articles. These

manufactures, machinery, textiles, vehicles, scientific instruments, chemicals and the like, compete with our own. Germany is, in fact, the chief supplier of these articles to the countries of Western Europe and is becoming an important competitor in markets farther afield. In 1959 Britain's three leading exports were machinery, vehicles and chemicals; the Federal Republic exported more of each of these three commodities than Britain, although Western Germany's textile exports were considerably less than ours.

For some years after the war Germany was forbidden to build any but the very smallest ships, but so rapidly have her shipyards at Hamburg, Bremen and Kiel, recovered that by 1954 the Federal Republic took second place to Britain in shipbuilding, ahead of Japan, the U.S.A. and Sweden. In 1957 Germany launched nearly as much new shipping as the United Kingdom, and actually exported, *i.e.* built for foreign countries, eight times as much as the United Kingdom did. By this time, however, Japan was by far the world's largest shipbuilder.

The Federal Republic's trade is mainly with the countries of Western Europe, the United Kingdom and the U.S.A. Apart from the Commonwealth, Western Germany is the United Kingdom's second best customer. Annual trade between the two countries is about £M150 each way.

Before the war the Eastern Zone exported its agricultural surplus to Western Germany in return for coal and manufactured articles. Now it gets coal from Poland, iron ore and steel from the U.S.S.R. Its imports are largely fuel, raw materials and consumer goods, its exports being machinery (especially vehicles, typewriters and household appliances), textiles and grain; 80 per cent. of East Germany's trade is with the nations of the Soviet bloc.

Above Farm houses in the Black Forest (*German Tourist Information Bureau*)

Below The Kurfurstendamm in post-war Berlin. Note the war-damaged church and the new buildings. (*German Tourist Information Bureau*)

Above The hydro-electric power generated at Vernayez is largely used by the Swiss Federal Railways. Note the power station at the foot of the hillside, the pipe-line bringing water from the upland lake or reservoir, and the flat cultivated valley bottom. (*Swiss National Tourist Office.*)

Below The Schreckhorn in the Bernese Oberland. Notice the serrated edges of the mountains, the snow and glaciers, and the high alpine pasture ("alp") bright with flowers. (*Swiss National Tourist Office.*)

CHAPTER XI

SWITZERLAND

General Characteristics

This country of five million people, athwart the Alpine system, is one of the most mountainous in Europe, to which fact may be traced some of the essential characteristics of the country.

(1) SWITZERLAND'S INDEPENDENCE.—The keynote of Switzerland is its independence, so often a characteristic of mountain peoples. It is the oldest republic of the modern world and owes its origin to the federation of the four forest cantons (Uri, Schwyz, Lucerne and Unterwalden) in a fight for liberty and for the purpose of the defence of the Alpine passes, especially the St. Gothard.

(2) POSITION AS THE CENTRE OF EUROPE.—In many respects Switzerland is a transitional country. This is evident in a study of the river system. In the south of the country the Rivers Toce and Ticino drain to the River Po and Italy; in the south-west the Rhone drains to France and the Mediterranean at Marseilles; in the north the waters of the Aar and Rhine drain to the North Sea; and in the east the River Inn drains to the Danube and the Black Sea. Thus Switzerland is, as it were, the natural focus of all central Europe and it is partly because of this and partly because of the political neutrality of Switzerland, that Geneva has been chosen as the headquarters of various international organisations. The transitional character of Switzerland is also shown by its languages and religions. There is no Swiss language and no established state religion. German is spoken by 73 per cent. of the people, French by 21 per cent., Italian by 5 per cent., the remainder of the people speaking dialects such as Romansch and Ladin which are derived from Latin (Fig. 61). In religion 57 per cent. of the people are Protestants and 42 per cent. Roman Catholic. It is thus that Switzerland partakes of the characteristics of the surrounding lands to which its rivers drain.

(3) INDUSTRIES.—In spite of its lack of coal and raw materials and its remoteness from the sea Switzerland is one of the great industrial countries of Europe. The high percentage of mountains and the unproductiveness of large areas have compelled the people to develop occupations other than farming. They have therefore concentrated on the manufacture of articles requiring much skill and relatively little raw material, *e.g.* watch-making, embroidery, etc. Many Swiss manufactures have become famous for their high standard of workmanship. Another aspect of this same type

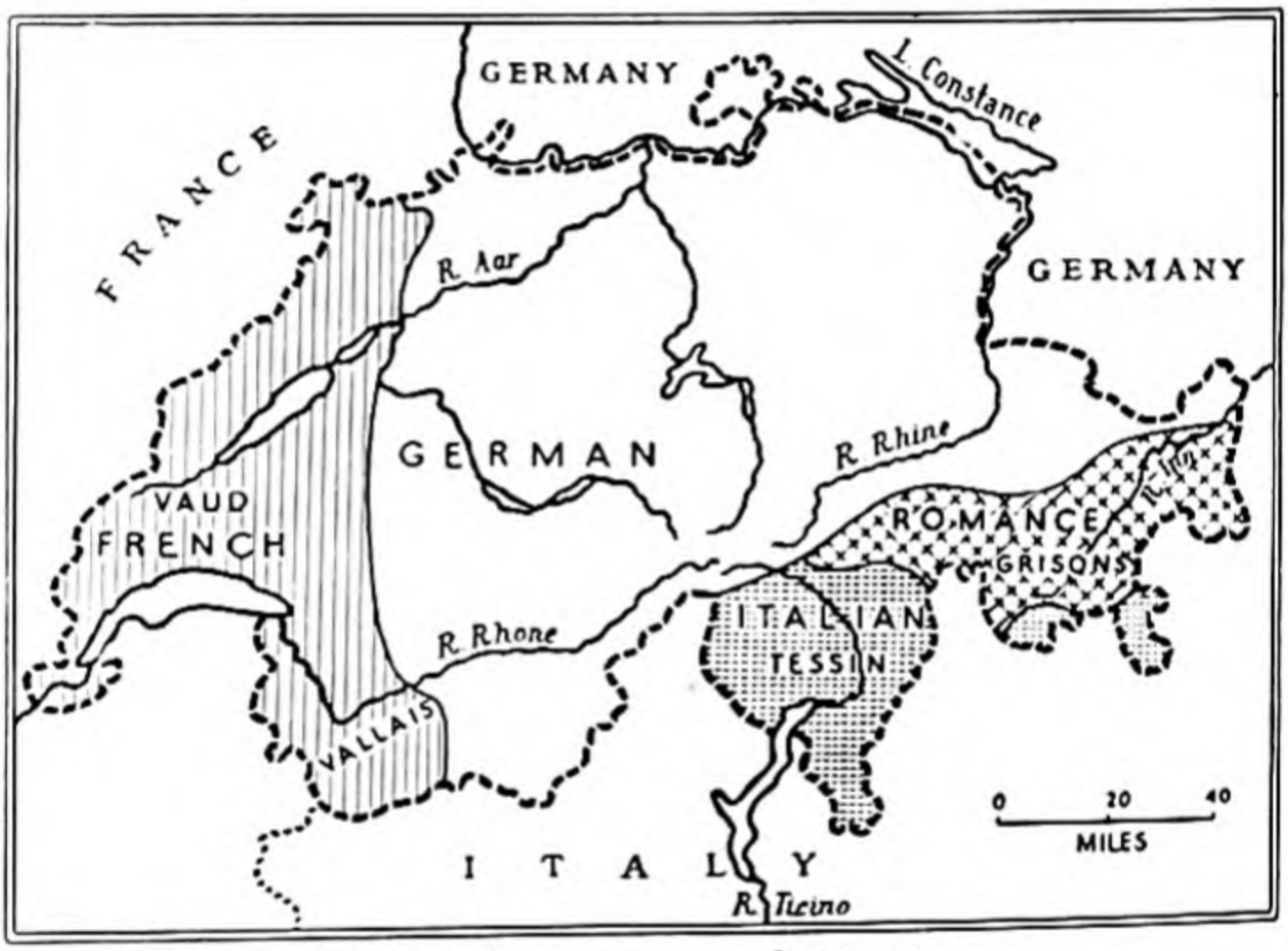


Fig. 61. SWITZERLAND. LANGUAGES.

of industry is in the manufacture of condensed milk, cheese and milk chocolate (*e.g.* at Vevey), which commodities are relatively more valuable, bulk for bulk, than the milk from which they are made. Therefore, in spite of long distances these products may be profitably exported.

(4) NATURAL RESOURCES.—Many of the major resources of Switzerland are closely connected with its mountainous build.

(*a*) The abundant supplies of water power and consequently of hydro-electricity, due to the large number of swift streams (see plate facing page 129).

(*b*) The mountain and lake scenery which gives rise to a prosperous tourist industry.

(*c*) The forests of the hill slopes, which cover nearly a quarter of the total area, are being most carefully controlled by the government lest excessive deforestation should result in the rapid denudation of the soil of the mountains.

(*d*) The rich " alp " pastures above the forests which are so important to the dairying industry. These form a valuable asset of the valley farmer who uses them as summer pastures for his animals, while the valley farm is being used for the cultivation of crops.

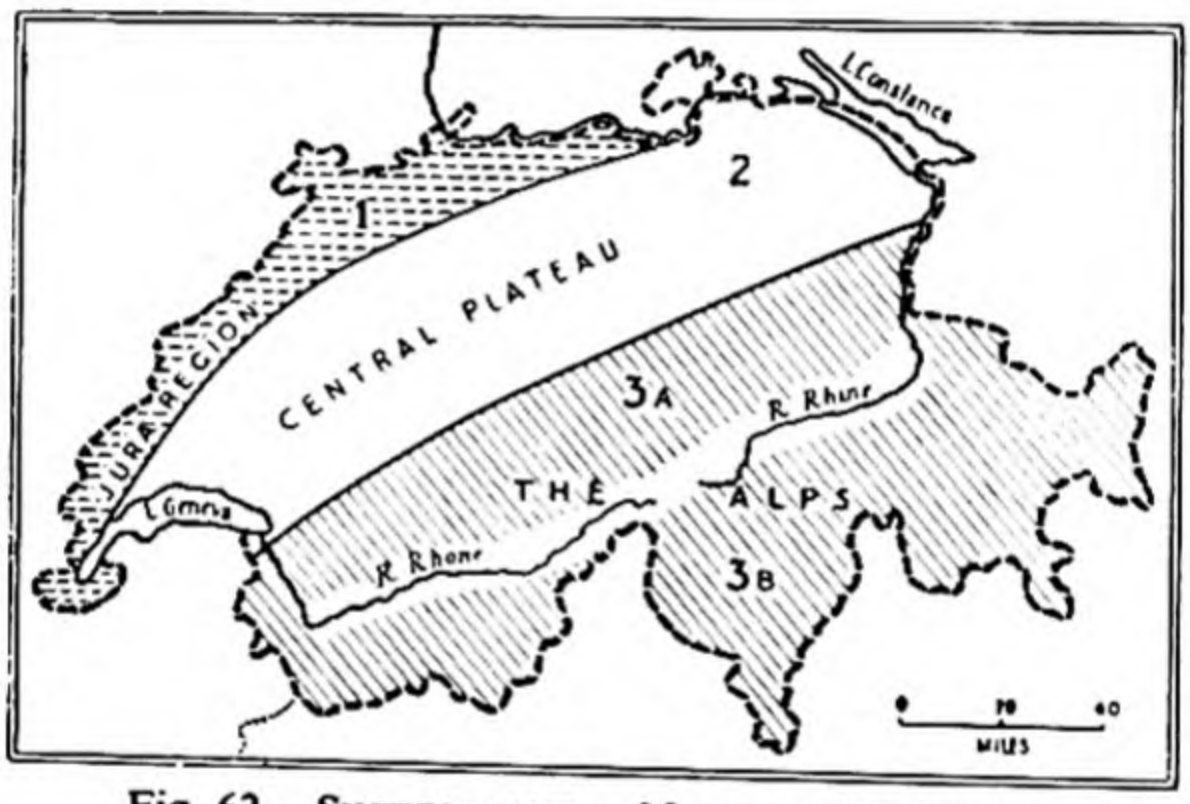


Fig. 62. SWITZERLAND. NATURAL DIVISIONS.

(5) LABOUR.—Switzerland possesses an abundant supply of intelligent and skilled labour.

Natural Regions and Economic Development

Structurally Switzerland may be divided into three zones all of which run from SW. to NE. (Fig. 62).

(1) The Jura.

(2) The Central Plateau.

(3) The Alps.

(1) THE JURA.—Rising to a height of 5,000 feet and extending along the whole length of western Switzerland, the Jura mountains are composed of Jurassic limestone and rocks of

similar age. They consist of a number of parallel folds across which west to east communication is difficult. The ridges are forested but the intervening valleys contain areas of rich meadow land used as summer pastures for cattle. It is in the Jura region that there is the greatest concentration of the watch-making industry, the chief town being La Chaux-de-Fonds. So extensive is this industry that in 1953 nearly 20 million watches and clocks were exported to all parts of the world. Watch making is the traditional industry of the Juras and was originally carried on in the homes of the people to supplement the meagre agricultural resources. To-day, it is a factory industry employing nearly half a million people.

Along the south-facing slopes of the Jura are terraced vineyards, and at the foot of the mountains is a line of industrial towns the chief of which are Neuchâtel (on Lake Neuchâtel) and Solothurn.

(2) THE CENTRAL PLATEAU.—The Central Plateau extends from Lake Geneva in the SW. to Lake Constance in the NE. Its average elevation is from 1,500 feet to 3,000 feet, so that, although it is the "central depression" of Switzerland, its average altitude is similar to that of the plateau of Wales. Along the southern edge of the plateau and partly in the northern valleys of the Alps are a number of beautiful lakes, viz. Lakes Thun, Brienz, Lucerne and Zurich. These were formed by the deposition of morainic dams across the valleys during the Ice Age, when the Swiss glaciers were more extensive and reached lower levels than at present.

The plateau is covered with a mantle of fertile glacial deposits. Dairy farming is everywhere of great importance, and because of this nearly 50 per cent. of the farmland is permanent pasture, and most of the remainder is used for the production of hay and other grass crops. Few cereals are grown and for this reason grain ranks high on the list of imports. The large yield of milk is the basis of the manufacture of cheese, butter, milk chocolate and condensed milk, much of which is exported.

The plateau is also the great industrial region of Switzerland. There are four important industrial centres (Fig. 63).

(*a*) Around Zurich (400,000), where there are large manufactures of silk. cotton and electrical machinery.

(*b*) Around St. Gallen (70,000) which is noted for cotton manufactures and embroidery.

(*c*) Around Aargau where there is a variety of industries including straw plaiting, knitting, and the manufacture of ribbons and leather goods.

(*d*) At Schaffhausen on the Rhine where rapids occur, and where hydro-electric power is used for the smelting of aluminium.

The industrial towns of the Swiss plateau, using electricity for power, and characterised by their cleanliness and absence

Fig. 63. SWITZERLAND. ECONOMIC REGIONS.

of smoke, are a strong contrast to the smoky and often ugly industrial towns of the British and German coalfields.

Although the Swiss plateau comprises less than one-quarter of the total area of Switzerland it supports nearly three-quarters of the total population. This is due to both intensive agriculture and the high degree of industrial development.

Berne (160,000) on the River Aar, is the capital of Switzerland, though only the third town in size. It controls routes

(*a*) southward via the Gemmi and Simplon passes to northern Italy, (*b*) south-westward to Geneva, (*c*) northward to Basel, and (*d*) north-eastward to Zurich.

Basel (200,000) is situated at the great bend of the Rhine, and controls routes (*a*) down the Rhine to the North Sea, (*b*) south-westward via the Burgundy Gate to the Rhone valley and Marseilles, and (*c*) southward to the Swiss plateau and via the Alpine passes to Italy. It is one of the great route centres of Central Europe (Fig. 64), and as a port it rivals, *e.g.* Manchester or Bristol in tonnage, handling 5 million tons a year, 90 per cent. being imports.

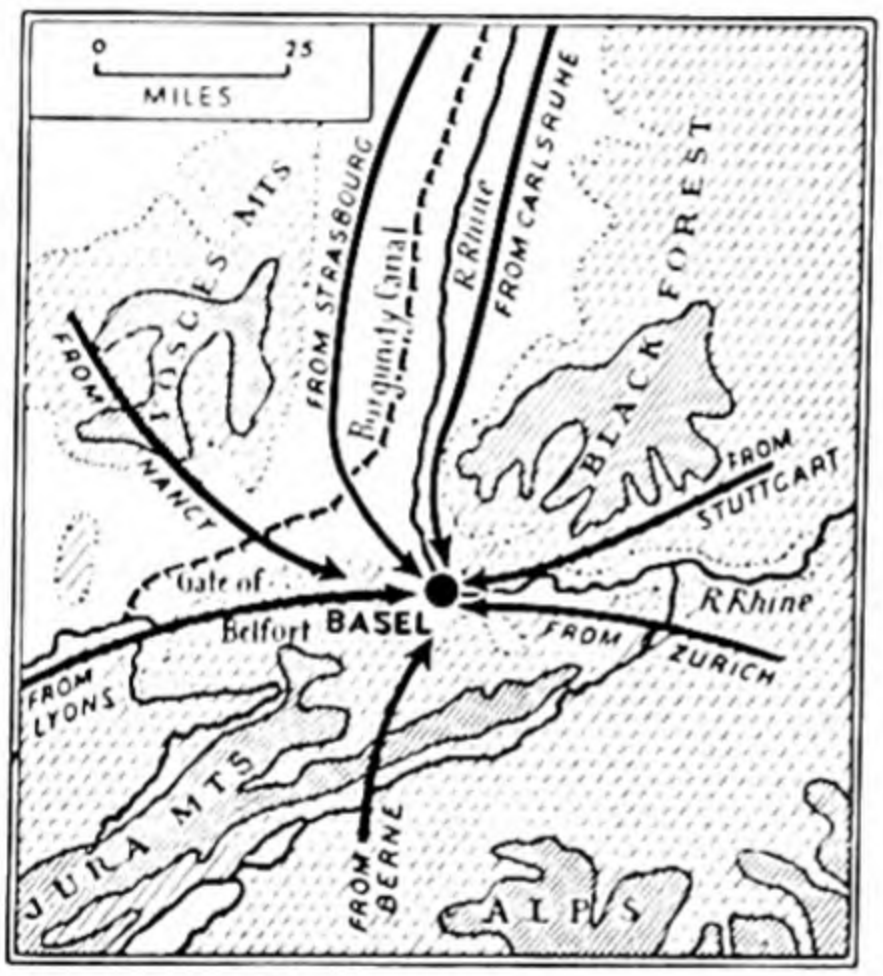


Fig. 64. THE POSITION OF BASEL.

(3) THE ALPS.—The Alpine section of Switzerland occupies nearly three-quarters of the total area of the country. Because of its high altitude, low temperatures, heavy snowfall, and difficult communications it is the most scantily populated and least developed section of the country. The Swiss Alps fall into two divisions:—

(*a*) The Limestone Alps (*e.g.* the Bernese Oberland), a region of bold and majestic mountains (including the Jungfrau) and extensive glaciers. This region is drained northward by tributaries of the Rhine, *e.g.* River Aar, River Reuss.

(*b*) The mountains composed of ancient rocks farther south, *e.g.* the Pennine Alps containing such peaks as Mt. Blanc (15,000), Mte. Rosa (15,000) and the Matterhorn (14,000). The drainage of this area is principally southward to the River Po in North Italy. These two widely differing mountain zones are separated by a deep SW.-NE. depression about

125 miles long which contains the upper streams of the Rhone and Rhine, both of which rise in the St. Gothard mass.

In Eastern Switzerland is the upper valley of the River Inn, known as the Engadine. Owing to its easterly position and high altitude (over 5,000 feet) winter temperatures are low and the snow does not melt quickly. This fact, coupled with its sunny skies, has made the Engadine famous for winter sports, St. Moritz being the chief centre. The economic development of the Alpine region is mainly concerned with the tourist industry, forestry and farming.

The scenery of the Alps with their high peaks, deep glaciated valleys, forested slopes, gorges, waterfalls, glaciers and lakes, attracts large numbers of visitors each year. This is one of the most important "Playgrounds of Europe."

Agriculture is the principal occupation in the Alpine valleys. In the sunnier and more favoured valleys, particularly those draining to Italy, cereals, grapes and other fruits are cultivated. On the whole, however, dairying is the most important type of farming. Each valley farm has its section of "alp" above the tree line, which is used as summer pasture (cf. the saeters of Norway, page 82). The villages of the Alpine valleys are situated on the sunny south-facing side, *i.e.* the north side of an east to west trending valley.

Alpine Routes

The high Alpine region forms a barrier to communication between Northern Europe and the Mediterranean. Hence, throughout history, the Alpine passes have been of great importance. The chief north to south routes are:—

(1) The St. Bernard pass which links the Rhone valley with the Dora Baltea valley.

(2) The railway route from Berne through the Bernese Oberland via the Lotschberg tunnel to the Rhone valley and thence via the Simplon Tunnel to the valley of the River Toce, and Milan.

(3) The railway route from Zurich along the Reuss valley and via the St. Gothard tunnel to the valley of the River Ticino, and Milan.

(4) The Splugen Pass between the valley of the Hinter Rhine and the valley containing Lake Como.

(5) The Maloja pass which links the Upper Engadine with the Lake Como valley.

The Trade of Switzerland

Switzerland is a prosperous country and its foreign trade is large in relation to its size. This is due to its need for foodstuffs, raw materials and coal. Because of its specialised form of industrial development the exports are of relatively high value for their bulk.

Imports exceed exports by a large margin, but the adverse trade balance is partly compensated for by the "invisible exports" of the tourist industry bringing money into the country without the need to export goods in return.

Trade is mainly with Germany, the United States, France and Italy, and the principal imports and exports for 1955 were in order of value:—

Imports	Exports
Machinery	Machinery
Iron and Steel	Clocks and Watches
Coal and Petrol	Scientific Instruments
Grain	Chemicals
Cotton and Wool	Textiles
Fruit and Vegetables	Cheese

It will be noted that machinery heads the list of both imports and exports. That imported tends to be heavy machinery and that exported light machinery. Switzerland is the world's largest exporter of dyestuffs.

CHAPTER XII

THE DANUBE LANDS: (1) CZECHOSLOVAKIA

The Course of the Danube

The Danube is the great west to east waterway of Europe. It is navigable by river steamers to Ratisbon (Regensberg) in Germany, and by smaller boats to Ulm. Difficulties, however, are encountered through variations in level, formation of ice in winter, swift currents in some parts and the occurrence of rapids, particularly near the famous Iron Gorge. The effect of these has been twofold. It has tended to draw the

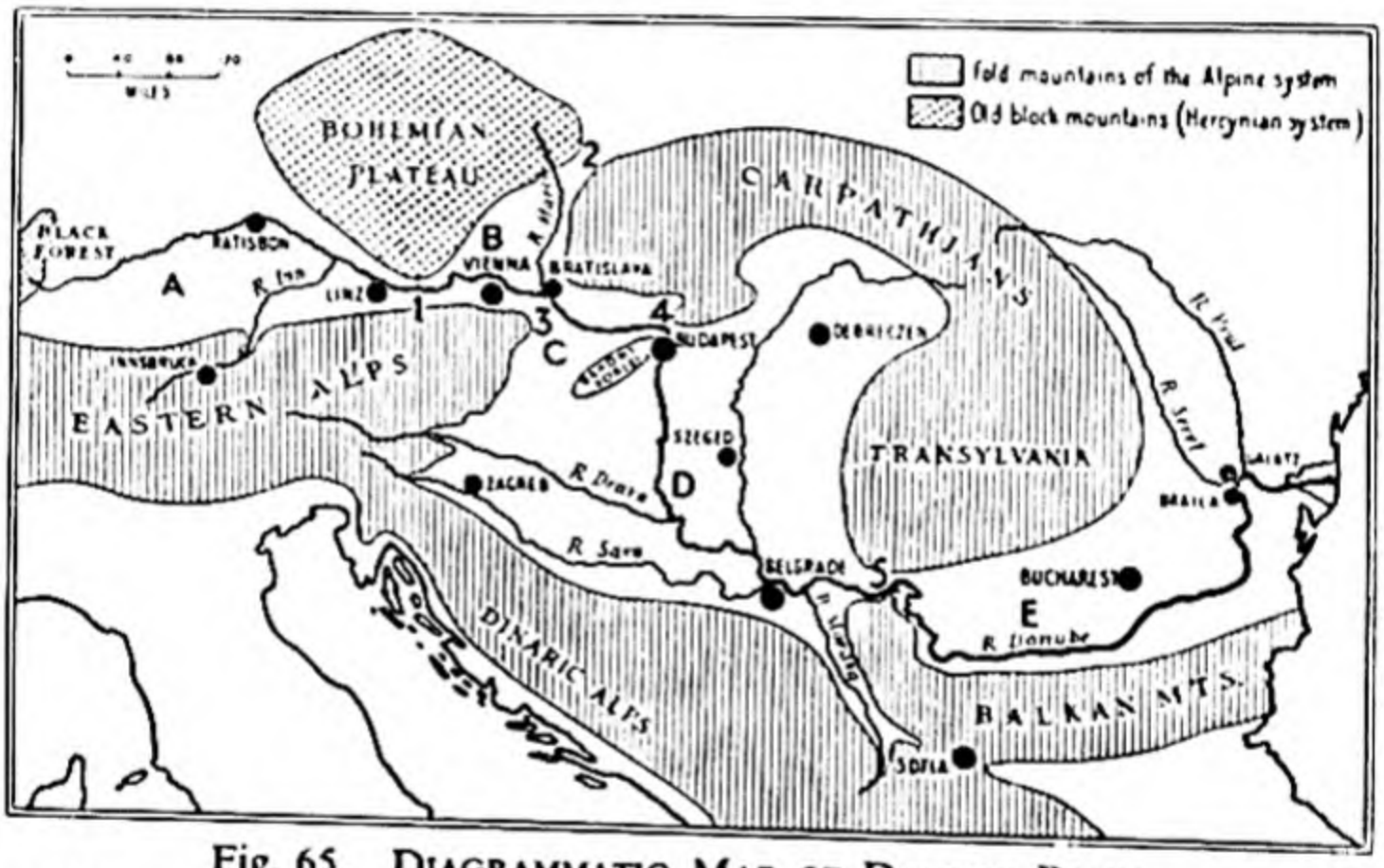


Fig. 65. DIAGRAMMATIC MAP OF DANUBE BASIN.
A, South Germany. B, Vienna lowlands. C, Upper Hungarian Plain. D, Great Hungarian Plain. E, Wallachian plains (Roumania).
1. Austrian Gate (Linz Gate). 2. Moravian Gate. 3. Pressburg or Bratislava Gate. 4. Hungarian Gate. 5. Iron Gates.

trade of the lower basin mainly towards the Black Sea and has made the road and railway systems of the basin the more reliable form of transport.

The river rises in the Black Forest and flows for 1,700 miles eastwards to the Black Sea through regions of structural, climatic, and racial diversity. In its course the river flows through several large basins linked by narrow valleys or "gates" (Fig. 65). The first part of the course of the Danube

lies in South Germany (A). It flows north-east to Ratisbon (Regensburg) and thence south-east, its direction being diverted by the Bohemian block. At Linz it enters the narrow Austrian Gate (1) formed by the approach of the Alps from the south and the Bohemian block from the north. Leaving the Austrian Gate, the river flows across the plains of Vienna (B) to Bratislava (Pressburg) where the river after receiving a small but important tributary, the March, breaks through the Alpine system by a narrow gap (3). Beyond Bratislava the Danube crosses the Little Hungarian plain (C) and turning sharply south crosses the Bakony Wald by the Hungarian Gate (4) at the southern end of which is the Hungarian capital, Budapest. South of Budapest the river meanders over an extensive and very flat plain, the Hungarian Plain (D). A series of right-angled bends occur in its course, where the tributaries Drava, Sava and Tisa (Theiss) join the main stream. At each confluence the main stream takes the direction of the tributary stream. Beyond Belgrade, at the confluence of the Sava, the Danube flows eastward and once more cuts through the main Alpine system by the Iron Gates (5) between the Transylvanian Alps and the Balkan Mountains. The river now enters the Roumanian plain of Wallachia (E), but before reaching the Black Sea its course is diverted northwards by the low plateau of the Dobruja. At its right-angled bend near Galatz it receives the Seret and Prut and thence flows eastward to the Black Sea.

Climate

For most of the Danube basin, the climate may be described as transitional between the equable conditions of Western Europe and the extremes experienced in Russia. The winters are cold, summers warm, rainfall moderate with the heaviest falls occurring in the summer months. Vienna, for example, receives 25 inches of rain per annum, 15 inches falling in the period March to October. January temperatures average 29° F. (*−2° C.*), but in July, the hottest month, the average is 67° F. (*19° C.*). The diversity of relief within the basin causes, however, much variation as elevation increases.

Racial and Political Problems

As a result of the War of 1939-45 and consequent boundary changes, the Danube basin is now shared by Germany, Austria, Czechoslovakia, Switzerland, Hungary, Yugoslavia, Roumania, Bulgaria and Russia. No wonder problems of control of river traffic arise. It is agreed that some form of international control is desirable, but the actual method to be employed is still a matter in dispute.

The causes of the racial diversity in the Danube lands have been dependent upon a number of factors. During historic time Eastern Europe has been open to migrations of peoples from the steppes of Russia and Asia. To these peoples, the forested Carpathians were a barrier which obstructed their westward advance. In particular, the Slav migrations followed two routes: (1) along the northern edge of the Carpathians as far as Bohemia, and (2) via the lower Danube as far west as the Adriatic. Thus the Slavs of the Danube lands fall into two groups: (1) the northern Slavs who comprise the population of Bohemia, Moravia and Slovakia, and (2) the southern Slavs who make up the population of Yugoslavia.

Between the North and South Slavs live the Hungarians, descendants of the Magyars who also originated from the steppes. They entered the plains of Hungary by the Carpathian Gate, a low pass between the headwaters of the River Dniester and Tisa. The Austrians speak a Germanic language, and the Roumanians one akin to that of the Romance peoples (*i.e.* Italian, Spanish, etc.), for Roumania was originally a province of the Eastern Roman Empire.

The Bulgarians are a Slavonic type, but their settlement in South-East Europe is of a later date than that of the rest of the South Slavs.

Geographical conditions tend to make the parts of the basin occupied by these various peoples economically interdependent, but nationalist feelings are so strong that natural advantages have been sacrificed by the retention of small political divisions.

After the War of 1914-18 the political boundaries of the Danube lands were fixed, as far as possible, by linguistic considerations. The new countries were made to include all territory in which the population consisted of 50 per cent.

or more of its own "nationals". It was inevitable that there should be left in each country groups of other peoples and these minorities provided the great political problem of Central and South-Eastern Europe. Some of the major problems connected with these minorities came to a head in 1938, and provided an excuse for the German move against Czechoslovakia. At about the same time Hungary took Transylvania from Roumania and the U.S.S.R. took over Bessarabia. Most of these changes have, however, been short-lived. The frontiers of Czechoslovakia were restored in 1945 except for the area around Teschen and the region of Eastern Ruthenia. [See Fig. 47 (*a*).] Roumania regained Transylvania but not Bessarabia where Russian elements predominate.

Czechoslovakia, Roumania, Bulgaria and Hungary now have Communist governments, under Soviet influence, and are "Iron Curtain" countries. An anti-Communist rising in Hungary in 1956 was suppressed by Russian armed forces. Russia appears to have more or less annexed the South Dobruja area of Roumania, and to be pursuing a policy almost of colonisation along the Black Sea coasts of Roumania and Bulgaria. Large numbers of Soviet immigrants have been settled in the South Dobruja in place of Moslem peasants of Turkish extraction, who have been deported to Turkey.

Yugoslavia, although having a Communist form of government, is at variance with the other Communist states of Eastern Europe, and is now tending to align herself, both politically and economically, more closely with the countries of Western Europe.

CZECHOSLOVAKIA

From 1918 to 1939 the states of Bohemia, Moravia and Slovakia (together with Ruthenia which is now part of the U.S.S.R.) formed the Republic of Czechoslovakia. From the outset the country faced a number of difficult problems, all of such a nature as would militate against the stability and unification of the republic. Foremost amongst these was the question of the German minority. Consequently, following the restoration of independence in 1945, one of the first acts carried out by the government was to expel from Bohemia thousands of Germans, thus increasing the tragic hordes of

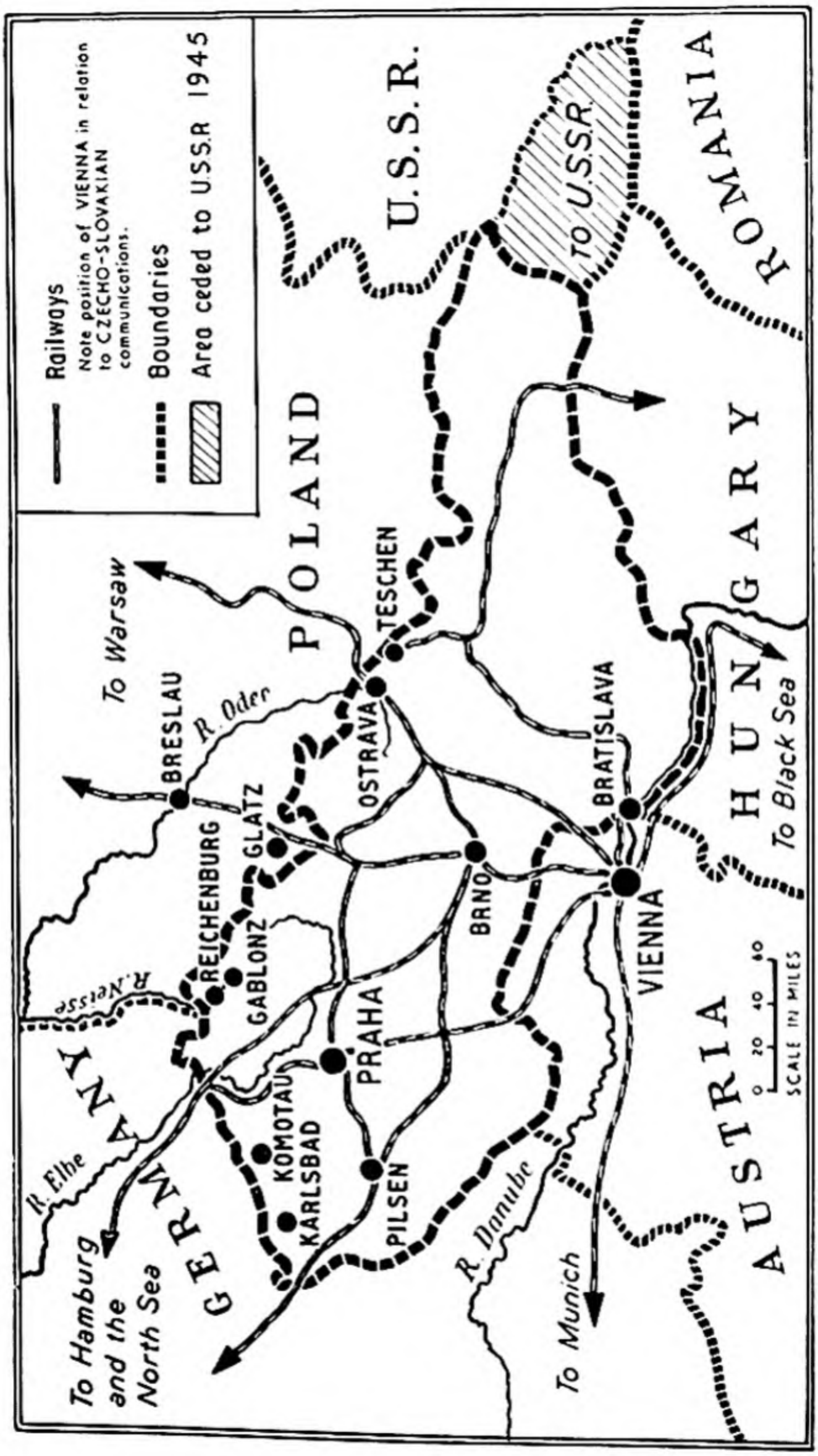


Fig. 66. CZECHOSLOVAKIA. COMMUNICATIONS.

displaced persons seeking homes within the restricted area of the Reich.

Czechoslovakia is long and narrow in shape. The distance between the capital, Prague, and the eastern frontier is nearly as great as the distance from Prague to the Straits of Dover. Without a coastline the country is at a great economic disadvantage, even though navigation rights may be accorded on the Oder, Elbe and Danube, and special privileges granted at the ports on the North and Adriatic Seas. The country is made up of sharply-contrasting regions of relief, and these regions differ in their economic needs. Finally, the difficulties arising from the variety of peoples are intensified

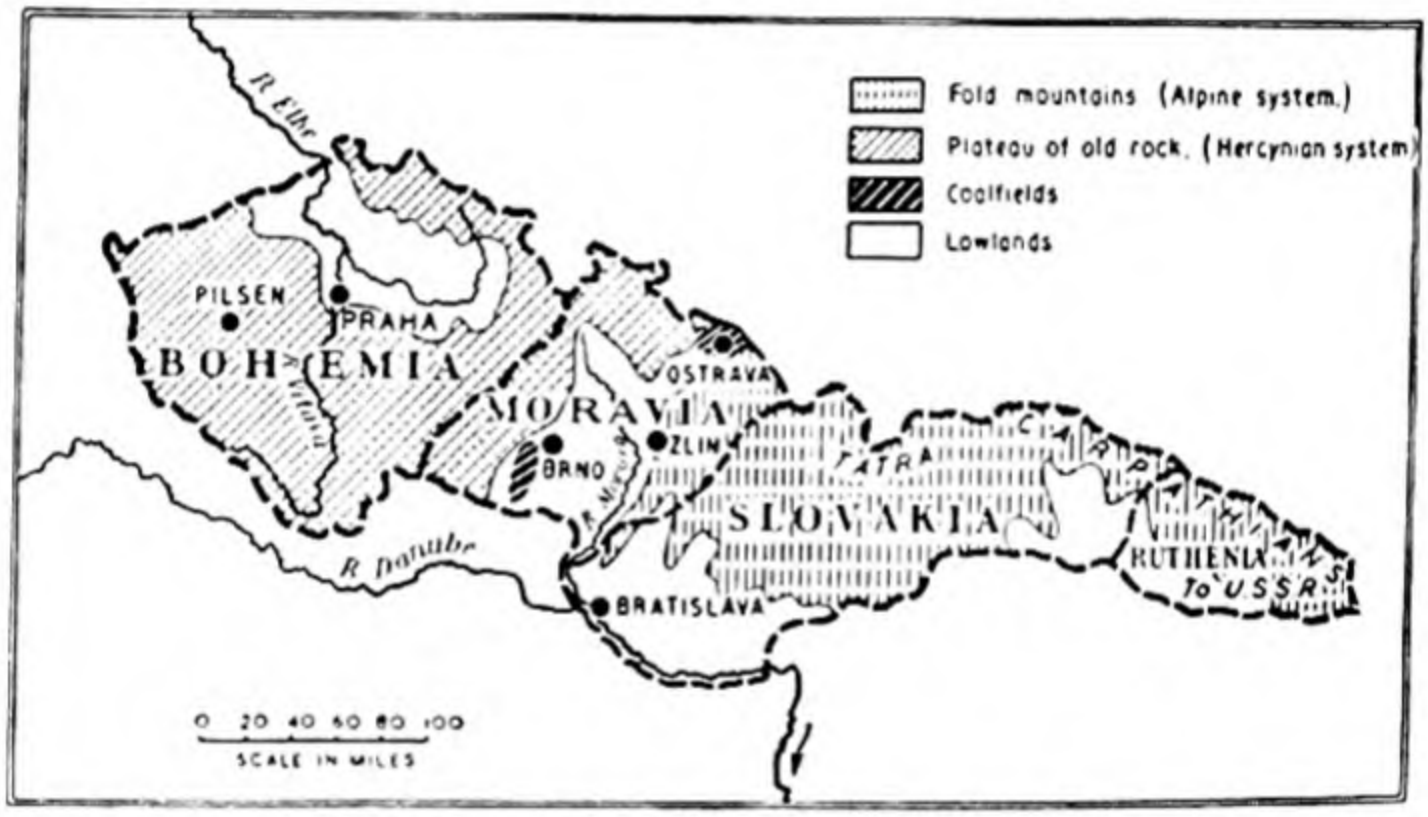


Fig. 67. THE NORTH SLAV STATES.

by the religious differences of the two main groups, for the Czechs are for the most part Roman Catholics, while the majority of the Slovaks are Protestant. The population is thirteen million.

In spite of these difficulties Czechoslovakia became one of the most advanced countries of Europe. Agriculture was developed to such a high standard that the country was almost self-supporting in regard to food supplies. Her reserves of coal and other minerals became the basis of a large number of manufacturing industries including engineering, textiles, glass, leather and chemicals. Her forests, too, were an important source of wealth and were utilised for paper making and the manufacture of furniture. The

industries of Czechoslovakia have more than recovered from the effects of the war of 1939-45, and industrialisation has gone further ahead under Communist rule. In 1960, output of hard coal was 28 million tons, of brown coal 58 million tons, of iron ore 3 million tons and of steel 7 million tons. More than half Czechoslovakia's exports consist of manufactures, mainly machinery and equipment. More than half her imports are fuel and raw materials and nearly a quarter is food. Most of her trade is with the Soviet bloc and only about one-eighth is with Western Europe.

Natural Divisions

Czechoslovakia may be divided into three natural regions—

(A) Bohemia, (B) Moravia, (C) Slovakia.

(A) BOHEMIA.—This western part of the republic consists almost entirely of the ancient blocks of highland which form part of the old mountain system of Central Europe (Fig. 4). It is a basin-shaped plateau surrounded on all sides by higher land which rises to the Bohemian Forest in the south-west; to the Erz Gebirge in the north-west; to the Sudetes in the north-east; and to the Moravian Heights in the south-east. The plateau is drained by the upper course of the River Elbe which flows northward through the Elbe Gate to Germany. The fertile basin surrounding the upper Elbe is a rich agricultural region where wheat, barley, rye, sugar beet and hops are extensively cultivated. The production of sugar beet ranks next to that of Germany, and the refining of sugar is one of the important industries. Most of the hops are used in the breweries of Pilsen (Plzen, 130,000) but considerable quantities are also exported. As in other countries of Central Europe, potatoes are used for the manufacture of starch and the distillation of alcohol. There are small reserves of lignite (brown coal) in the north. The lignite is used for the manufacture of ammonia and fertilisers, and is burned to provide power for the generation of electricity.

Engineering and metallurgical works are important, especially near Pilsen where the world-famous Skoda works are situated. The Erz Gebirge contain rich deposits of lignite or brown coal, *e.g.* at Komatau, the total yield in 1960 amounted to nearly 55 million tons. There are also

deposits of zinc, uranium, iron, and graphite, as well as the china clay deposits which are the basis of the important porcelain industry in the vicinity of Karlsbad. The district around Reichenberg is important for its cotton manufactures, while woollen, silk and linen goods are made in other parts of this area. Probably the most important industry is glass making. There are over 1,000 glass factories, most of which are located in the area near Gablonz (Jablonec), and these manufacture every conceivable type of glass from optical lenses to imitation jewels. Other industries include chemicals, paper making in the forested area and the manufacture of iron and steel. The greater resources and high degree of industrialisation make Bohemia a more densely-populated region than either Moravia or Slovakia.

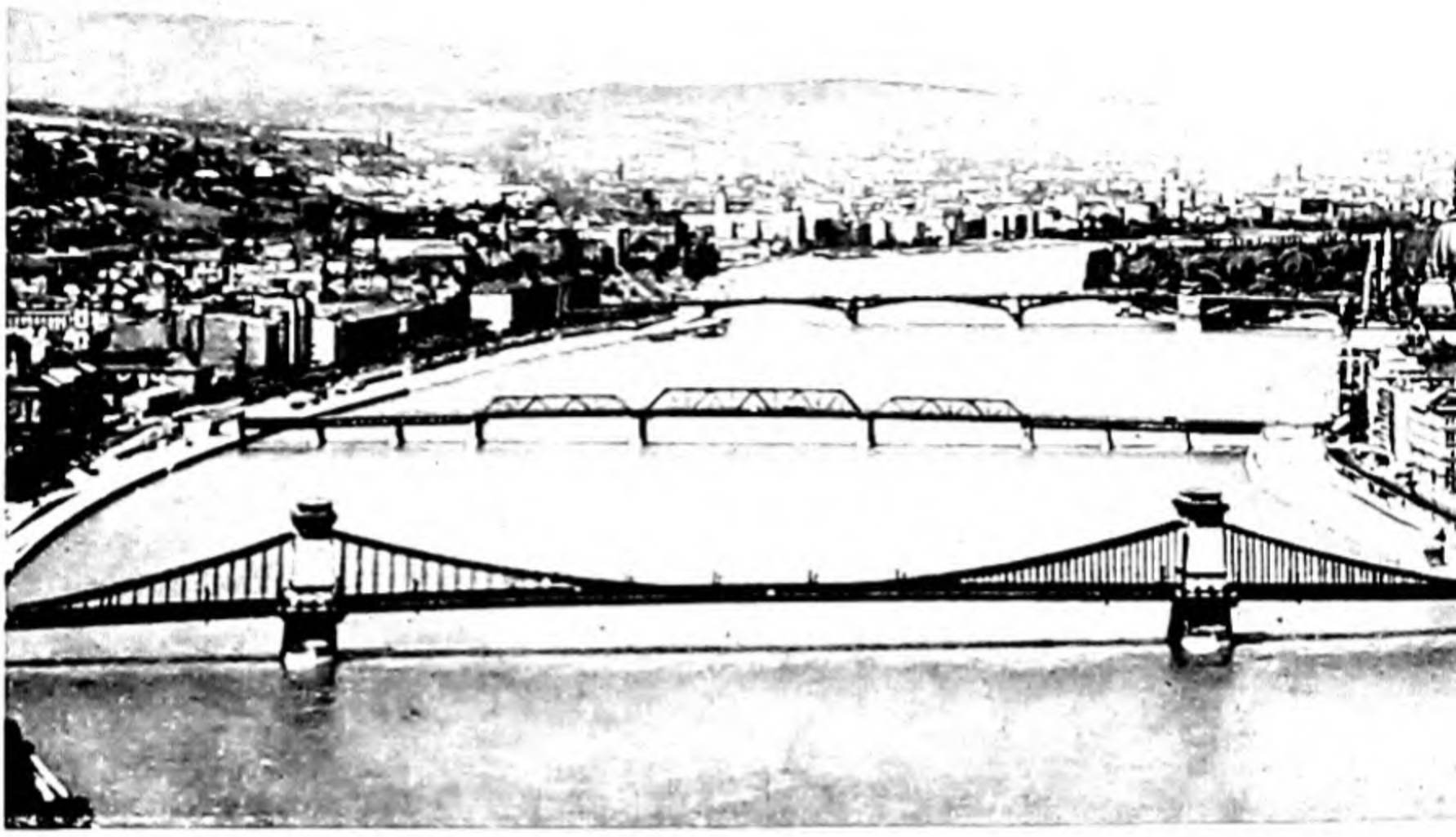
Prague (Praha, 950,000), the capital, on the Vitava (Moldau) stands almost at the centre of Bohemia. It commands routes via the Elbe valley to Germany and along the Moldau valley to Vienna and is the great industrial centre of the state. Brewing, leather manufacturing and sugar refining reflect the dependence of the town on the surrounding farm lands for materials; engineering results from the mineral wealth of the bordering mountains.

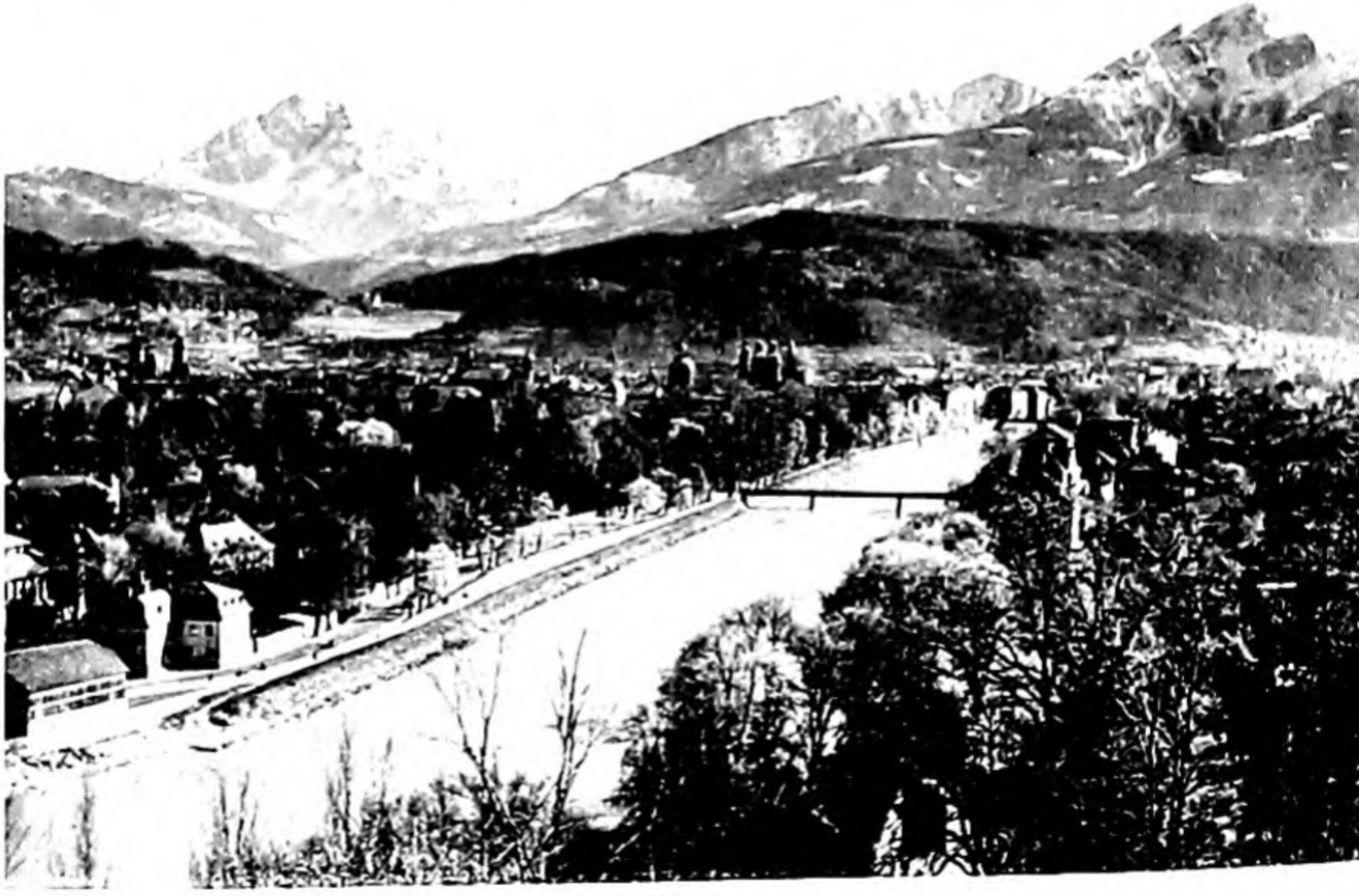
(B) MORAVIA.—Moravia lies between Bohemia and Slovakia. For the most part it consists of a broad lowland which rises gently to the Moravian Heights on the west, and to the Carpathians on the east (Fig. 67). Structurally, therefore, Moravia is composed of old rocks in the west; of recent rocks forming lowlands in the centre; and of part of the Fold Mountain system of Southern Europe in the east. The central lowland is drained by the River March, a tributary of the Danube, to which it flows southward. The lowland forms a natural highway between Poland in the north and the Danube lands to the south (Figs. 65 and 66). So low is the divide between the Oder and the March that a canal has been constructed to join them.

The Moravian lowland is a rich agricultural region, where large crops of barley, wheat and sugar beet are cultivated. Though not so highly industrialised as Bohemia, Moravia has a number of notable manufacturing centres. *Brno* (Brunn, 300,000), is the chief centre of the textile industries,

Above A view in the Austrian Tyrol, where the tourist industry is important. (*Austrian Travel Bureau.*)

Below Czechoslovakia—new workers' flats on the outskirts of Gottwaldov (formerly Zlin), where there are very large leather works, and boot and shoe factories. (*Czechoslovak Embassy.*)





Above Budapest, the capital of Hungary. In the foreground, the old bridge over t Danube, and behind it two new post-war bridges. The view is taken facing north, wi Buda on higher ground to the left and Pest on lower ground to the right. (*Paul Popper*

Below Innsbruck in the Austrian Tyrol. (*Austrian State Tourist Department*)

manufacturing cotton and woollen goods. At Gottwaldov, formerly Zlin (see plate facing page 144), are immense leather works and boot and shoe industries. In the extreme north of the lowland is a small portion of the Silesian coalfield producing about two-thirds of the high-grade coal of Moravia. As the coal is excellent for coking there are large metal-working centres especially at Ostrava (200,000) and Vitkovice.

(C) SLOVAKIA.—Slovakia lies to the east of Moravia. It consists mainly of highland and in this respect offers a strong contrast to Moravia. The wide western portion of the Carpathians occupies the greater part of the state and, except for the river valleys, the only lowland of any extent lies in the south. This lowland is a northern extension of the Hungarian plains and provides Czechoslovakia with a frontage of about 100 miles along the Danube and a river port at Bratislava (Pressburg).

As a portion of the highland is forested, lumbering is one of the most important occupations. Except for the manufacture of wood-pulp and paper there are few industries in Slovakia. Agricultural activities reach their best development on the southern plains, for the mountain valleys are only of moderate fertility. Wheat, sugar beet and maize are the principal crops. On south-facing slopes, sheltered from the cold winds, vines are successfully grown.

Bratislava (Pressburg or Pozsony), the capital, is situated on the Danube and is an important river port with a population of 240,000. It commands routes (*a*) westward up the Danube valley to Southern Germany and Western Europe, (*b*) northward across the Moravian lowlands to Poland, and (*c*) southward across the Hungarian plains to Budapest, Belgrade and the Mediterranean.

CHAPTER XIII

THE DANUBE LANDS: (2) AUSTRIA AND HUNGARY

AUSTRIA

Geographically the country falls into three main regions:—

(1) The Alpine Ranges. (2) The Alpine Foreland (Low Plateau). (3) The Vienna Basin (Lowlands).

(1) THE ALPINE RANGES.—The Austrian Alps extend from the Rhine to Vienna, a distance of 320 miles, and occupy by far the greater part of the country. Relatively narrower and loftier in the west, they widen eastwards, becoming more open and more accessible. Communication from east to west is facilitated by a depression occupied by the upper courses of the rivers Inn, Salzach and Enns. Communication from north to south is by passes, *e.g.* the Brenner and Semmering passes.

The resources of this region, though limited, have never been fully developed. In the higher mountains of the west less than 5 per cent. of the land is suitable for agriculture, but here, in the beautiful Tirolese country (see plates facing pages 144 and 145), strenuous efforts have been made to establish a prosperous "tourist" and winter sports industry. In the richer valleys of the west, cereals and fruits are grown and efforts are being made to increase the dairying industry. Small centres for the manufacture of silk and cotton goods also occur. Thus the activities of Vorarlberg may be regarded as a replica of those of the neighbouring parts of Switzerland.

The more open valleys of the east support a larger population. Cereals are grown in the lowlands, fruits on the terraced lower slopes, and the mountain streams are used to generate power for local industries. In Styria and Carinthia iron ores are worked around Eisenerz and Klagenfurt respectively. Graz also has some importance as an iron-working centre.

The mountain sides are forested to a height of about 5,000 feet. These forests have been carefully conserved to

ensure future supplies of timber and to prevent soil erosion. They provide the raw material for wood-pulp, paper and timber industries. Wood products form an important item of the export trade of the Alpine region. As a source of electric power the Austrian Alps have not been utilised to the same extent as the Swiss Alps. Three-quarters of Austria's power is hydro-electric and the amount generated has quadrupled since 1940. A vast scheme is now in progress to dam back the Danube near Vienna in a chain of large lakes to provide sufficient hydro-electric power for the whole of Austria's needs.

Fig. 68. AUSTRIA: NATURAL DIVISIONS AND CHIEF TOWNS.

(2) THE ALPINE FORELAND.—This is the region of undulating country between the Czech frontier in the north and the Alpine Ranges to the south. Across it flows the Danube between Passau and Krems. Here fertile basins alternate with deep gorges whose forested slopes are crowned with castles, reminiscent of those seen along the gorge section of the Rhine (see page 119). Agriculture is important in this region, where arable land accounts for over half the area. The cultivation of wheat and fruits receives most attention, but interest in pastoral farming is increasing. Steyr is the chief market centre.

(3) THE VIENNA LOWLANDS.—The region around Vienna is a rich agricultural area with a large acreage devoted to

vineyards, cereals and sugar beet. As the Hungarian frontier is approached, however, drier conditions lead to a greater interest in stock-rearing. Vienna itself has the varied industry usually associated with a capital city. These include engineering and the manufacture of textiles and clothing. Production of the oilfield around Matzen, now about 2½ million tons a year, is falling off.

Although the Vienna lowlands occupy only about one-tenth of the total area of Austria, they contain over 60 per cent. of the population. This is largely because Vienna alone, with a population of 1,800,000, accounts for 28 per cent. of the Austrian population. The size of this city is out of all proportion to the extent and resources of the country. But Vienna was once the capital of the Austro-Hungarian Empire, which consisted of Czechoslovakia, Hungary and much of Yugoslavia, including her Adriatic coastline, in addition to Austria. As the leading city of this empire of very large resources and 30 million people, Vienna developed on lines similar to London, Paris and Berlin and became one of the greatest cultural centres of Europe. Deprived, after the war of 1914-18, of her greatest industrial area (Bohemia) and her richest farmlands (Hungary), Vienna went through a period of great economic difficulty. The same privations were experienced after the 1939-45 War, when shortages,

(1) VIENNA 1914
Central position in a large Empire.

(2) VIENNA 1918
The capital of a small state.

Fig. 69.

particularly of food, brought the townspeople to the verge of starvation, despite relief measures.

As a route centre, however, Vienna's natural advantages remain and are possibly unrivalled in Europe. Vienna controls—

(*a*) The route via the Moravian Gate, north-eastward to Poland and the Baltic (Fig. 70).

(*b*) The route via Bohemia and the Elbe Gate, northward to Berlin and the North Sea.

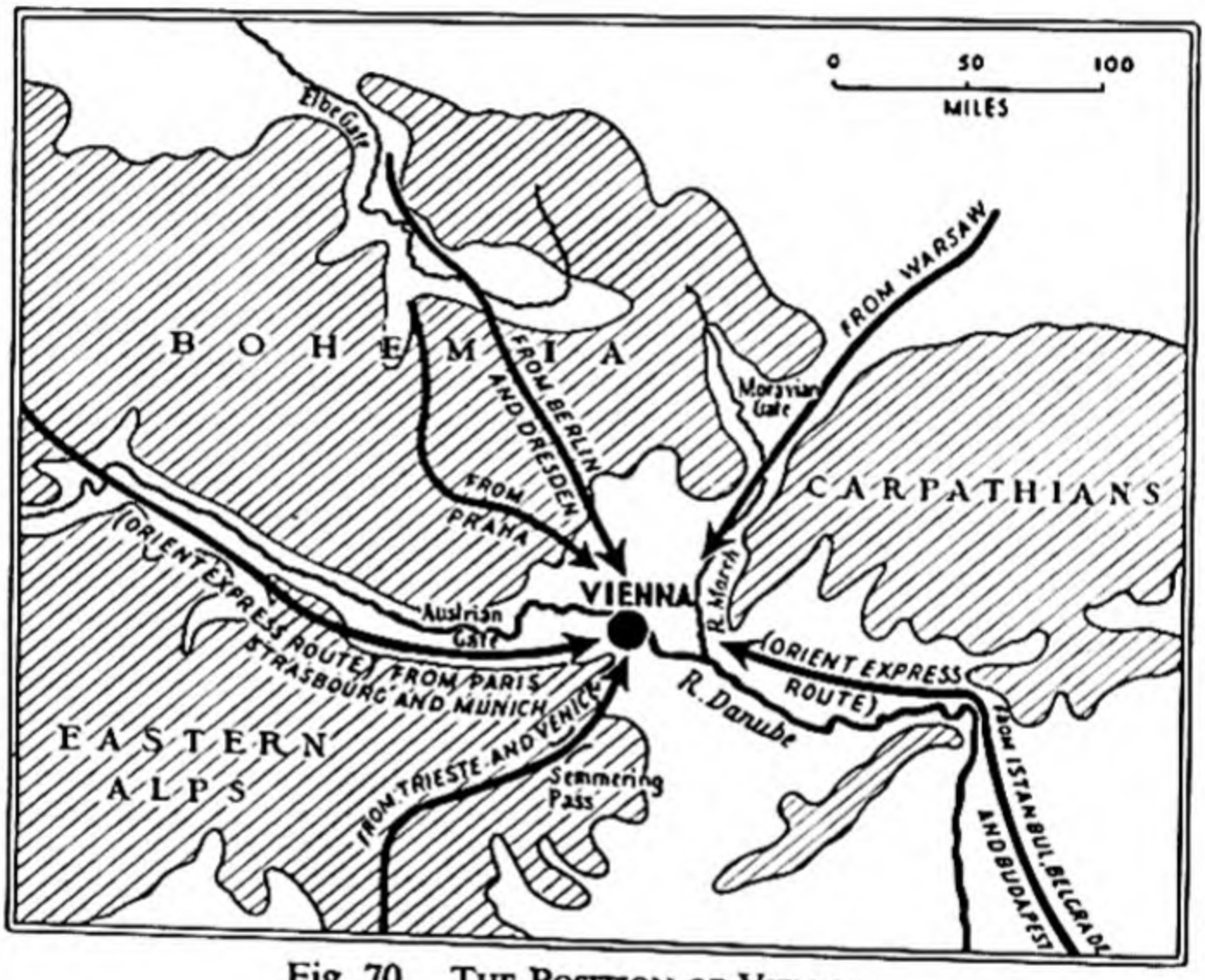


Fig. 70. THE POSITION OF VIENNA.

(*c*) The route westward via the Upper Danube to South Germany, the Rhine and Paris.

(*d*) The routes south-eastward down the Danube Valley to Budapest, Belgrade and the Black and Aegean Seas.

Trade

Austria's trade is mainly with the Federal German Republic, Italy, the U.S.A. and Great Britain. Foodstuffs, fuel, raw materials and vehicles are imported. Wood, wood-pulp and paper account for one-third of the exports, and iron, steel goods and machinery for another third.

HUNGARY

Physical Features

Modern Hungary, not much larger than Ireland, but twice as densely populated, is a great inland basin surrounded on all sides by mountains of the Alpine system. This basin is a region of subsidence and in recent geological times was an inland sea. Parts of this depression still contain shallow lakes, *e.g.* Lake Balaton, whose average depth is ten feet. The only highland in the country is the ridge (Bakony Forest) that strikes south-westward from the Carpathians, and through which the Danube flows at the Hungarian Gate (4, Fig. 65). This ridge divides the plain into two parts, (*a*) the Little Alfold to the north-west, and (*b*) the Great Alfold to the south-east. Across this flat plain meander the Danube and its chief tributaries, the Tisa (Theiss) and Drava, which provide important means of transport. Regions near the rivers are liable to extensive floods. This is particularly the case with the Tisa. Deforestation in the highlands tends to aggravate the position, but as these areas, where the main stream and its tributaries (Koros and Muresul) have their sources, lie beyond the Hungarian frontier, measures for flood control are difficult to apply. Problems of this nature illustrate the unsuitability of a boundary line that crosses a river basin.

The soils of the plain are mostly extremely fertile, except the sandy regions between the Danube and the Tisa, where trees and special grasses have been planted to prevent the sand spreading over the cultivated areas.

Except for a coalfield near Pecs (output 20 million tons of mainly brown coal a year), a small recently-developed oilfield in Western Hungary (output 1 million tons a year), some bauxite, and building stone in the Bakony Forest, Hungary has little mineral wealth, and her forests are small. Hence agriculture is the chief occupation, but, since the war, the Communist régime has made intensive efforts to industrialise the country and the country now produces 2 million tons of steel a year.

Climate and Agriculture

The climate, which is very similar to that of the Steppe lands of the world, is favourable to the growth of cereals.

Shut off from sea influences by the encircling mountains (Fig. 71), Hungary has a climate which is typically continental, with hot summers, cold winters and light rainfall (20 inches to 25 inches), much of which falls during the summer half-year. Debreczen has an average July temperature of 71° F. (*22° C.*), a January temperature of 25° F. (*−4° C.*) and 25 inches of rain of which 15 inches fall in the summer months. This type of climate is so similar to that of the Steppe regions that

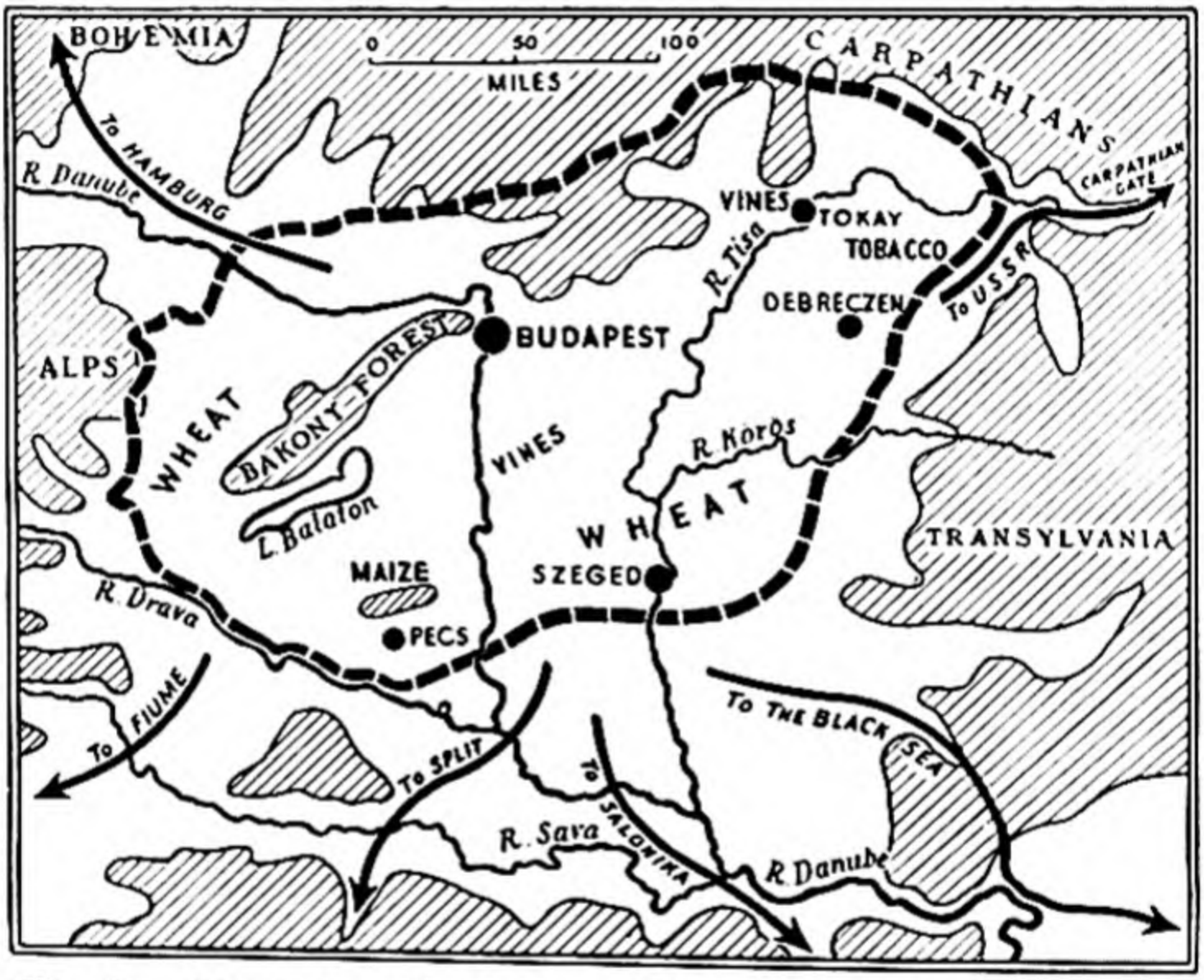


Fig. 71. HUNGARY. TO SHOW ITS POSITION IN RELATION TO THE SURROUNDING HIGHLANDS.—The crops named are especially important in the regions indicated.

Hungary is a grassland region particularly suited to the growing of cereals and rearing of animals (see plate facing page 160), but the rainfall is rather uncertain.

Maize, wheat and fodder grains, together with potatoes and sugar beet are grown extensively in the cultivated areas which are always within easy reach of the villages and towns. The yields of grain are not so high as in Western Europe, *i.e.* usually less than 12 cwt. per acre compared with 28 in Belgium.

In spite of the relatively low yields, Hungary is one of the "granaries" of Europe. Over 80 per cent. of the cultivated land is devoted to grain, and the area is steadily increasing at the expense of the pasture lands. This contrasts with the farming of North-Western Europe where pasture land is increasing and cereal cultivation decreasing. Near the villages, fruit and grapes are also cultivated and there is a considerable manufacture of wines, the best known of which is that of Tokay.

Away from the villages is the *puszta*. Puszta is a Slavonic word meaning "solitude." The pusztas are vast monotonous, treeless plains, where large herds of cattle, horses and sheep are reared. This occupation dates back to the settlement of the Hungarian plains by the nomadic Magyars over a thousand years ago. In the north-west, an area of 300 square miles east of the Tisa is now irrigated and under cultivation.

Villages and Towns

The Hungarians of the plains live in villages. Even such a large centre as Szeged (100,000) is one large village or rather an agglomeration of villages, for over half its inhabitants are peasant farmers. These straggling towns and villages usually lack all the amenities and social services of the cities of Western Europe. The roads, full of holes, are quagmires of mud when it rains and of little use for modern transport. Many of these towns are of large areas, *e.g.* Debreczen (120,000) covers an area of about 350 square miles, *i.e.* nearly half the size of Greater London, whose population exceeds eight million. The total population of Hungary is about ten million with a density of about 278 per square mile.

While Hungary is essentially an agricultural country, efforts have been made ever since 1920 to organise industries, principally those based on agricultural products, such as sugar refining, distilling, brewing and flour milling. Budapest is the greatest flour-milling centre in Europe. There are engineering works at Budapest, while imported cotton is the basis of a recently established textile industry. Aluminium is manufactured from bauxite, and steel production is about 1½ million tons a year.

Budapest (1,800,000), the capital of Hungary, is situated at the southern end of the Hungarian Gate, where the Danube

flows through the Bakony Forest. The city consists of two parts. Buda, with its ancient fortifications and government buildings, is on the high ground on the right bank. Pest is the industrial and commercial half of the city and is situated on the lowland on the opposite bank of the river. It is the chief industrial centre of Hungary and from it railways radiate to Vienna, Fiume, Belgrade and Transylvania.

The Trade of Hungary

Formerly Hungary's principal exports were wheat and flour, and other agricultural produce, together with aluminium ore and small amounts of textiles.

A remarkable change has come over the trade of the country as a result of post-war industrialisation. In 1958, more than one-third of Hungary's exports consisted of machinery and equipment, and less than one-sixth was food. Fuel and raw materials made up three-quarters of the imports. About one-third of the trade of Hungary is with Western Europe, the remainder being with the Communist countries of Europe and Asia.

The economic position in Austria and Hungary illustrates the loss incurred when political rivalries are allowed to outweigh geographical considerations. The natural resources of the two countries are largely complementary, but the creation of artificial boundaries has restricted the natural flow of trade. Other European countries have been handicapped in similar fashion. Holland and Belgium for over a century have been politically separated, but have realised the mutual advantages to be gained by economic co-operation. Together with Luxemburg they formed a union ("Benelux") for trade purposes, abolishing all import duties on goods passing from one country to another and all charging the same duty on goods from other lands. This union has been the forerunner of other economic unions in Europe, and none stands to gain more by co-operation than the mountainous country of Austria and the flat plains of Hungary.

CHAPTER XIV

THE DANUBE LANDS: (3) YUGOSLAVIA

Population and Transport Problems

Yugoslavia is the country of the South Slavs, and has a population of nearly nineteen million. Before 1914 much of the territory, viz. Crotia, Slavonia and Bosnia, which is now included in Yugoslavia, was part of the Austro-Hungarian Empire. In addition, the formerly independent

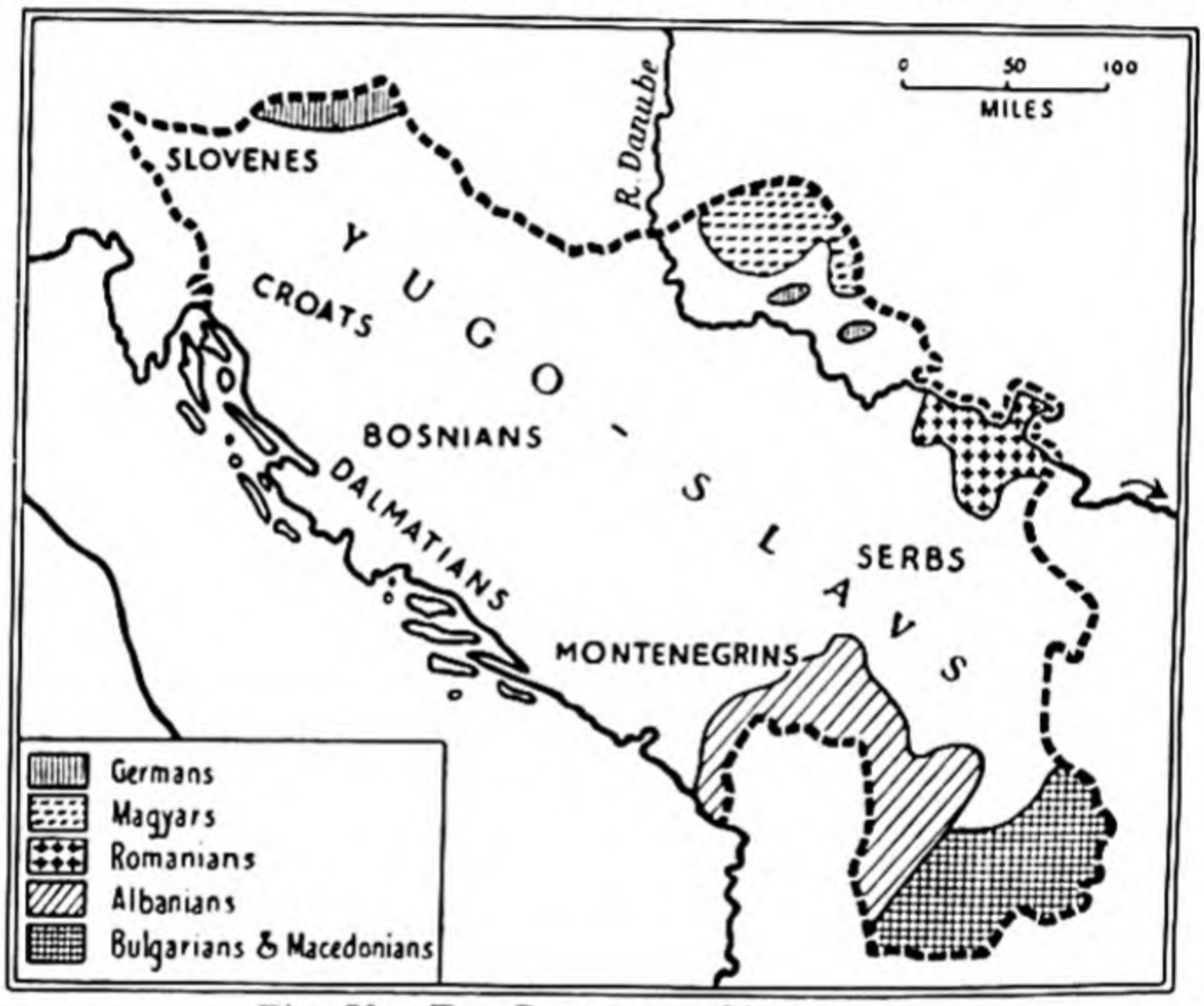


Fig. 72. THE PEOPLES OF YUGOSLAVIA.

Slav states of Serbia and Montenegro are incorporated in the new political unit. For many centuries these groups of South Slavs, of which the chief are Serbs, Croats and Slovenes, have developed along different lines (Fig. 72). The lack of co-operation between these groups and their struggles to dominate the government is one of the greatest problems of the country. The second great problem is that of transport, for the Dinaric Alps form a barrier between the most productive areas and the sea. The sea coast is of the Dalmatian type with good harbours, but the narrow coastal plain, the high mountain

ranges running parallel with it and the steep gradients behind it, make communication inland difficult (see plate facing page 160).

Industries

Yugoslavia is primarily an agricultural country, nearly two-thirds of the people being employed on the land. The principal crops are maize and wheat and there are more cattle and sheep per head of population than in Britain. There are, however, considerable mineral resources, although these are not yet fully exploited. They include coal and lignite (output 22 million tons), iron, bauxite, copper, lead and chrome ores.

The industries of the country are mainly in the north-west and are primarily those directly connected with agriculture, *e.g.* flour milling, brewing, tanning, etc., but there are also some small manufactures of textiles, leather goods and pottery. Many of the industries are of the domestic type. A characteristic occupation is the carpet making of South-East Serbia around Pirot. The carpets are made of pure wool and the secret of dying and colour mixing is handed down from father to son.

Natural Divisions

Yugoslavia falls into three natural divisions (Fig. 73):—

(I) The coastal plains and islands along the Adriatic Sea.

(II) The mountain region, known by various names, but most commonly called the Dinaric Alps.

(III) The interior plains which are structurally an extension of the plains of Hungary.

(I) THE ADRIATIC COASTLANDS.—The coastline of Yugoslavia is one of subsidence. Since the mountain ranges are parallel to the coast their partial submergence has produced long, narrow, hilly islands running parallel to the coast, and large harbours with narrow entrances.

Climatically this part of Yugoslavia belongs to the Mediterranean type with hot summers, warm winters and most of the rain during the winter half-year. Sometimes in the winter the region experiences an unpleasant cold wind called the "bora" which is similar in type and origin to the Mistral of the lower Rhone valley. Since the mountains approach so closely to the sea there is relatively little cultivable land, but typical Mediterranean products are grown, viz. grapes, olives and figs as well as wheat. Because of the limited land

available for agriculture many of the inhabitants are fishermen and sailors.

One of the most important aspects of the modern development of Yugoslavia is the attention which is being given to the development of ports and of communication between these ports and the interior. Fiume (now known as Rijeka, population, with Susak, 80,000) is the natural outlet for the northwest of Yugoslavia and, together with the former naval port of

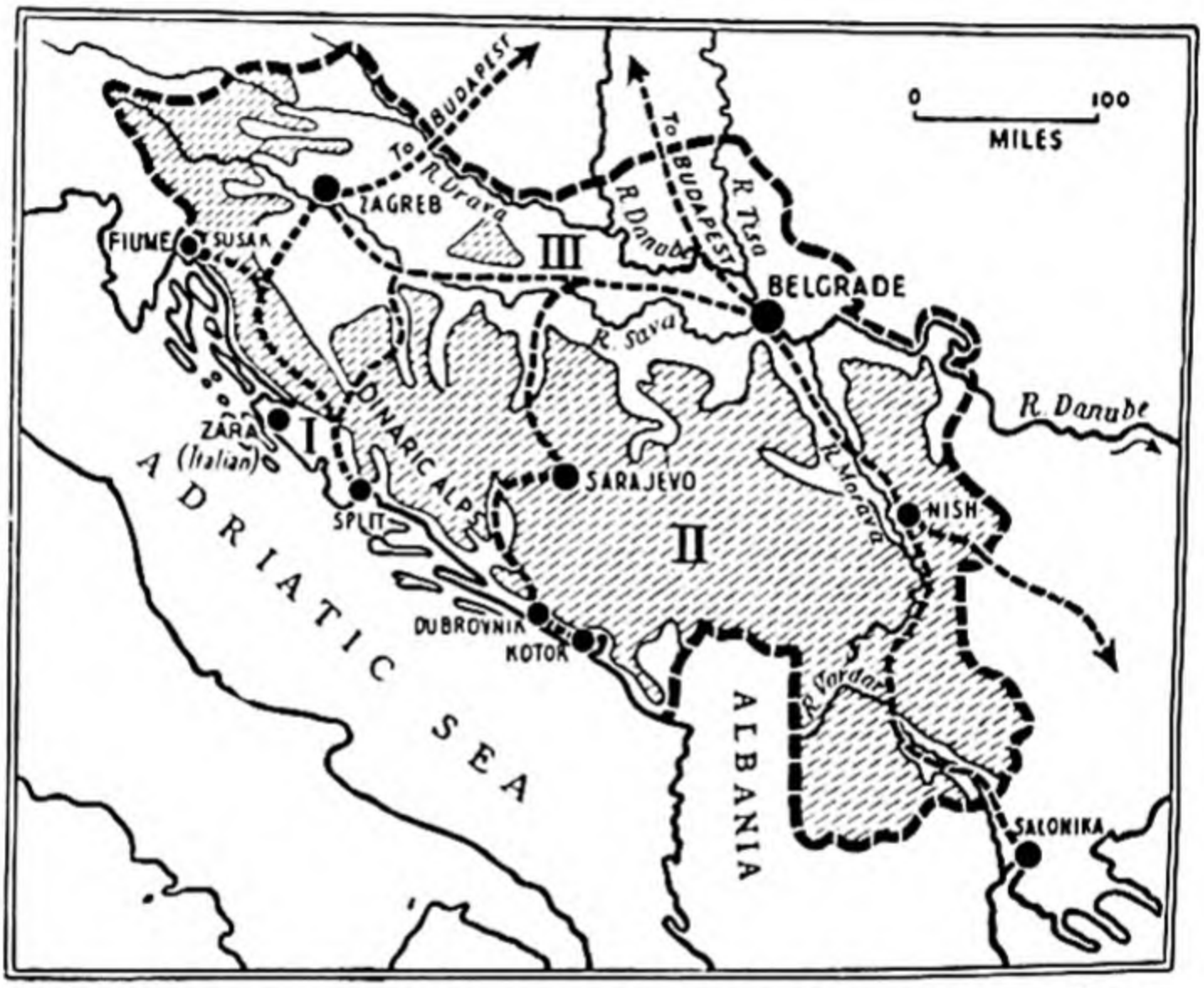


Fig. 73. YUGOSLAVIA, SHOWING NATURAL DIVISIONS AND ROUTE LINKING THE INTERIOR WITH THE MEDITERRANEAN SEA.—I. The Coastal Plains. II. The Mountain Region. III. The Interior Plains.

Pola, now comes within the new boundaries of Yugoslavia. Trieste has been handed over to Italy (page 189), and is now losing ground to Rijeka as the principal port for Czechoslovakia and Hungary.

Situated on the eastern side of the Istrian Peninsula, Fiume was the chief port of Hungary in 1914 and was ceded to Yugoslavia in 1919. Later it was seized by an Italian faction, although economically it serves the Danube basin rather than the plain of Lombardy. These political rivalries resulted in

the neglect of the port, as Yugoslavia preferred to create and use ports which were completely under her own control, such as Susak, Kotor and Split.

(II) THE MOUNTAIN ZONE.—The mountains of Yugoslavia are narrow in the north-west of the country behind Fiume, but they widen rapidly eastwards and occupy the whole of the southern portion of the country, rising in places to 8,000 feet.

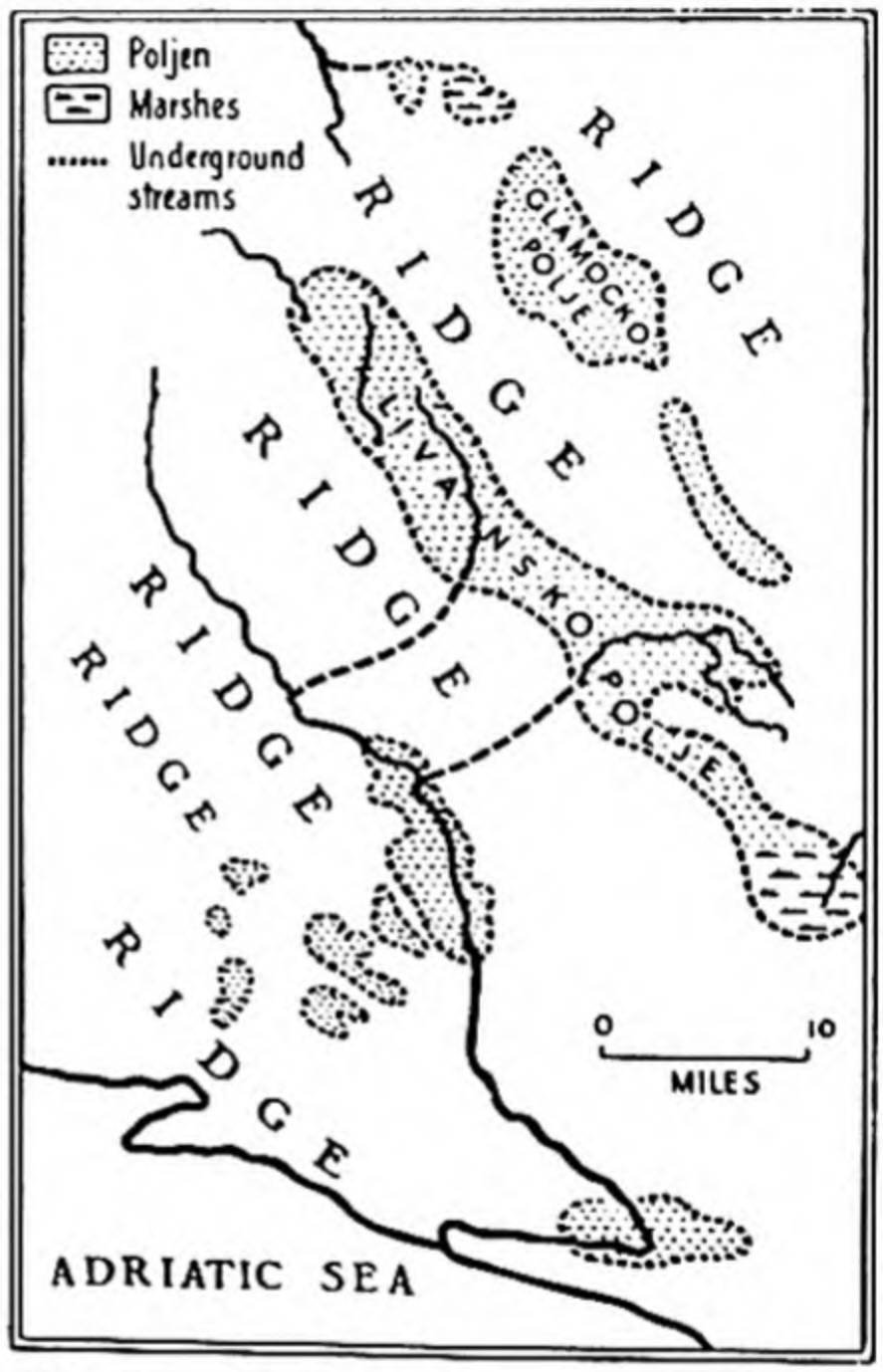


Fig. 74. A PORTION OF THE LIMESTONE REGION OF YUGOSLAVIA.

This mountain zone consists of a number of parallel north-west to south-east ridges which make communication from the interior to the Adriatic a matter of difficulty. The Dinaric Alps are composed of limestone and the characteristic scenery is that of the karst type with deep, steep-sided gorges, underground drainage, etc. This region, known as the Karst, has given its name to all other regions of similar structure and scenery. The villages are situated in depressions, called poljes or dolines, where accumulations of fertile soil make agriculture possible (Fig. 74).

Farther east, where the hills slope towards the river Sava, are extensive forests of beech and oak, in which large numbers of pigs are fed on the beech-mast and acorns. The forests constitute one of the most important timber reserves of Southern Europe. In recent times these forests have been

increasingly exploited and timber ranks as the first export of the country.

The extreme eastern section of the mountains is crossed by a well-marked north to south route, that of the Rivers Morava and Vardar. This route, which has been of great importance throughout history, links the plains of the middle Danube with the Aegean Sea at Salonika. In the Morava valley is Nish, an important railway junction on the Orient Express route, the point where the Belgrade-Salonika and the Belgrade-Constantinople routes diverge.

The south-facing valley of the Vardar experiences a Mediterranean climate, and tobacco, mulberry, grapes, etc., are cultivated.

(III) THE INTERIOR PLAINS.—North of the mountains, Yugoslavia consists of a lowland drained by the Rivers Drava, Sava, Tisa and Danube. Structurally, this is a continuation of the Hungarian Plain, and the climate, in contrast to that of the Adriatic coastlands, is of the continental type with extremes of temperature and summer rain. (Belgrade: July 72° F., January 29° F. and annual rainfall 24 inches, of which 15 inches falls in the summer half-year.) This is the richest agricultural region of the country and the crops are similar to those of Hungary, *i.e.* cereals, particularly wheat and maize. Because of the high summer temperatures and the large supply of water from the rivers, rice can be grown. Maize is of greater importance than wheat and is used both for human consumption and for the feeding of pigs. Maize and pigs are two of the most important items on the export list. On the higher lands bordering the plains to the south are extensive orchards of plum trees, the plums being dried and exported as prunes. In spite of the large number of swift streams little hydro-electric power is generated except in the forested areas of the north-west where it is utilised in saw mills.

Belgrade (470,000), the capital, is situated in the fertile interior plains at the confluence of the Sava and Danube (see plate facing page 161). It was originally the capital of Serbia. It controls the following routes:—

(*a*) Southward, via the Morava-Vardar valleys to Salonika and the Aegean Sea.

(*b*) South-east, via the Morava valley, Sofia and the Maritza valley to Constantinople (the Orient Express Route).

(*c*) Eastward, down the Danube to the Black Sea.

(*d*) Northward, via the Danube valley to Budapest and Central Europe.

(*e*) Westward, over the mountains to Fiume and Split.

Zagreb (350,000), on the Sava, is the second city of importance. It is an important route having direct rail communication with Budapest, Belgrade, Split, Fiume and Vienna.

The Trade of Yugoslavia

Since Yugoslavia's breach with the other Communist countries her trade has been largely with the countries of the west, although about one-quarter is still with the countries of the Soviet bloc. Italy, Western Germany, the U.S.S.R., the United Kingdom and Switzerland are her best customers and the United States, Germany, Italy, and the U.S.S.R. her principal suppliers.

The principal exports are timber, refined lead, maize and meat. Other exports include mineral ores of iron, aluminium, chromium, manganese and zinc. Imports are chiefly textiles, vehicles, machinery and fuels. In 1960, British exports to, and imports from, Yugoslavia were both worth about £15 million.

The predominance of manufactured goods in the import list emphasises the relative absence of manufacturing activities, and the nature of the principal exports likewise lays stress on the agricultural economy of the country.

CHAPTER XV

THE DANUBE LANDS: (4) ROUMANIA, BULGARIA, ALBANIA AND TURKEY

ROUMANIA

The Country: Agriculture and Climate

The modern state of Roumania corresponds very closely in extent with the limits of the old Roman province of Dacia. The name of the country and the language of the people are

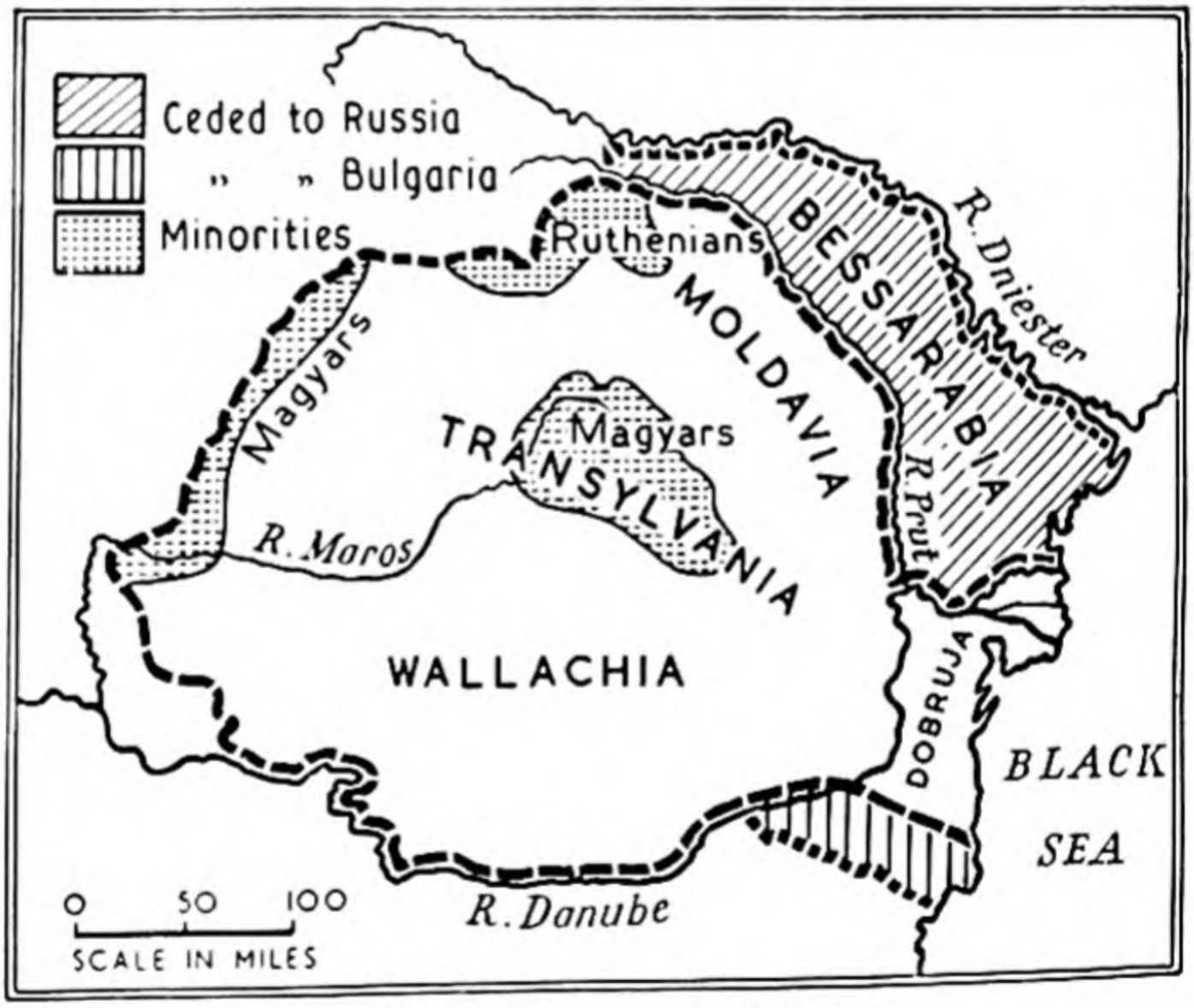
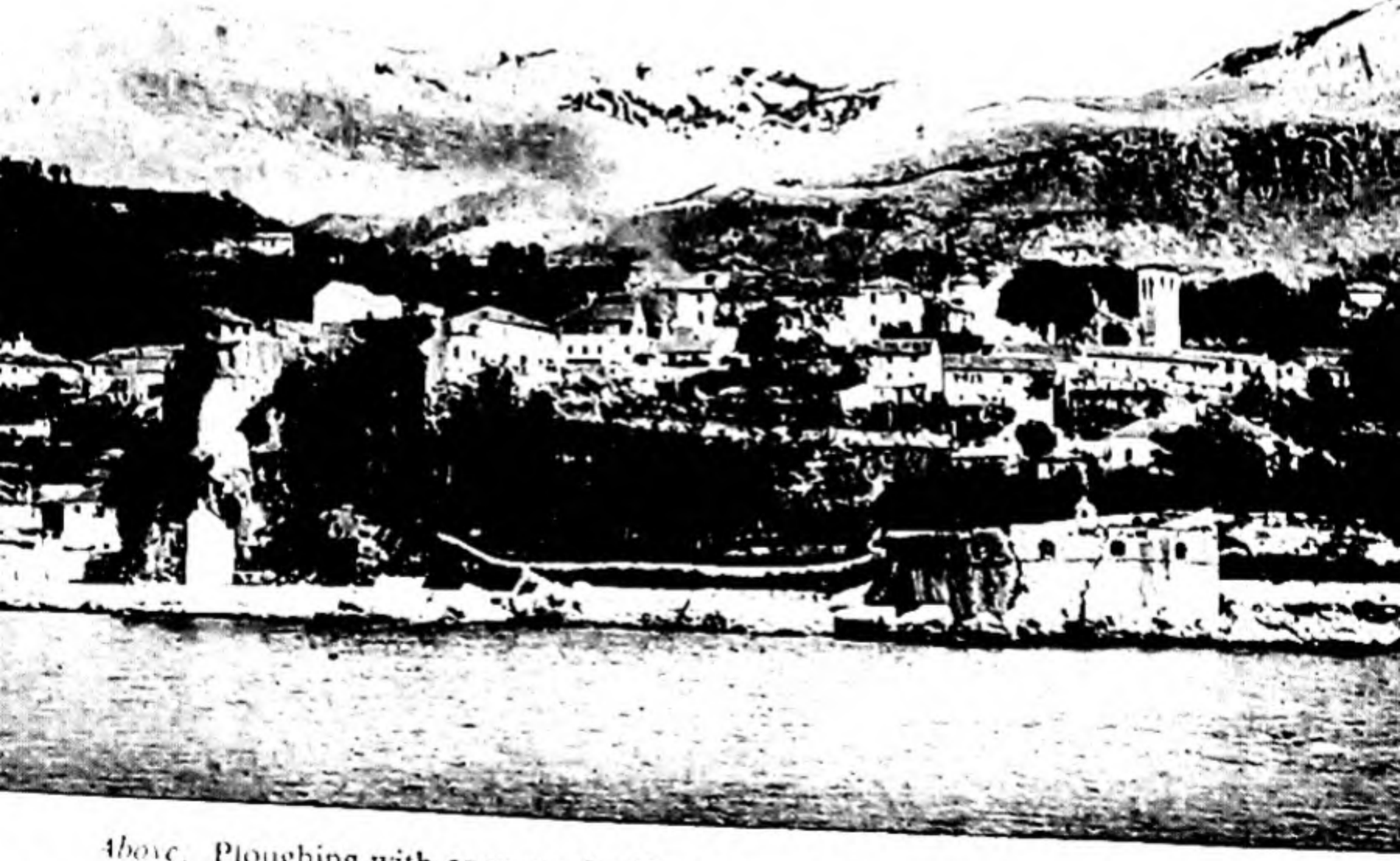


Fig. 75. THE PEOPLES OF ROUMANIA.

heritages of the Roman occupation. The pre-war Roumania consisted of the two lowland provinces of Wallachia and Moldavia and of the Dobruja which was annexed in 1878. To these were added in 1918 the provinces of Transylvania,



Above. Ploughing with oxen on the Hungarian plains. (*Ewing Galloway, N.Y.*)

Below. Bocca di Cattaro, an Adriatic seaport in Yugoslavia, at the foot of steep limestone cliffs. Dalmatia has a concordant coast with mountains running parallel to the sea. There are numerous breaches in the coastal ranges, giving good sheltered harbours, but the difficulty of communication inland across the mountains deprives them of any real hinterland. (*Ewing Galloway, N.Y.*)

Above The river front at Belgrade, at the confluence of the Drava and the Danube (in t
distance). *(Ewing Galloway, N.Y.)*

Below Yugoslavia is mainly an agricultural country, but there are very valuable miner
resources. The illustration shows a chemical factory at Jajce in Bosnia, using local ra
materials. *(Ewing Galloway, N.Y.)*

Bessarabia and Bukovina, with large minorities of non-Roumanian peoples (Fig. 75). The population is sixteen millions. Roumania is a country rich in resources but backward in development.

The soil is very fertile and agriculture is the chief means of livelihood, but yields are low, mainly because of primitive farming. Many of the fields are still sown and harvested by hand. Over 80 per cent. of the population is engaged in agriculture and more than 85 per cent. of the cultivated

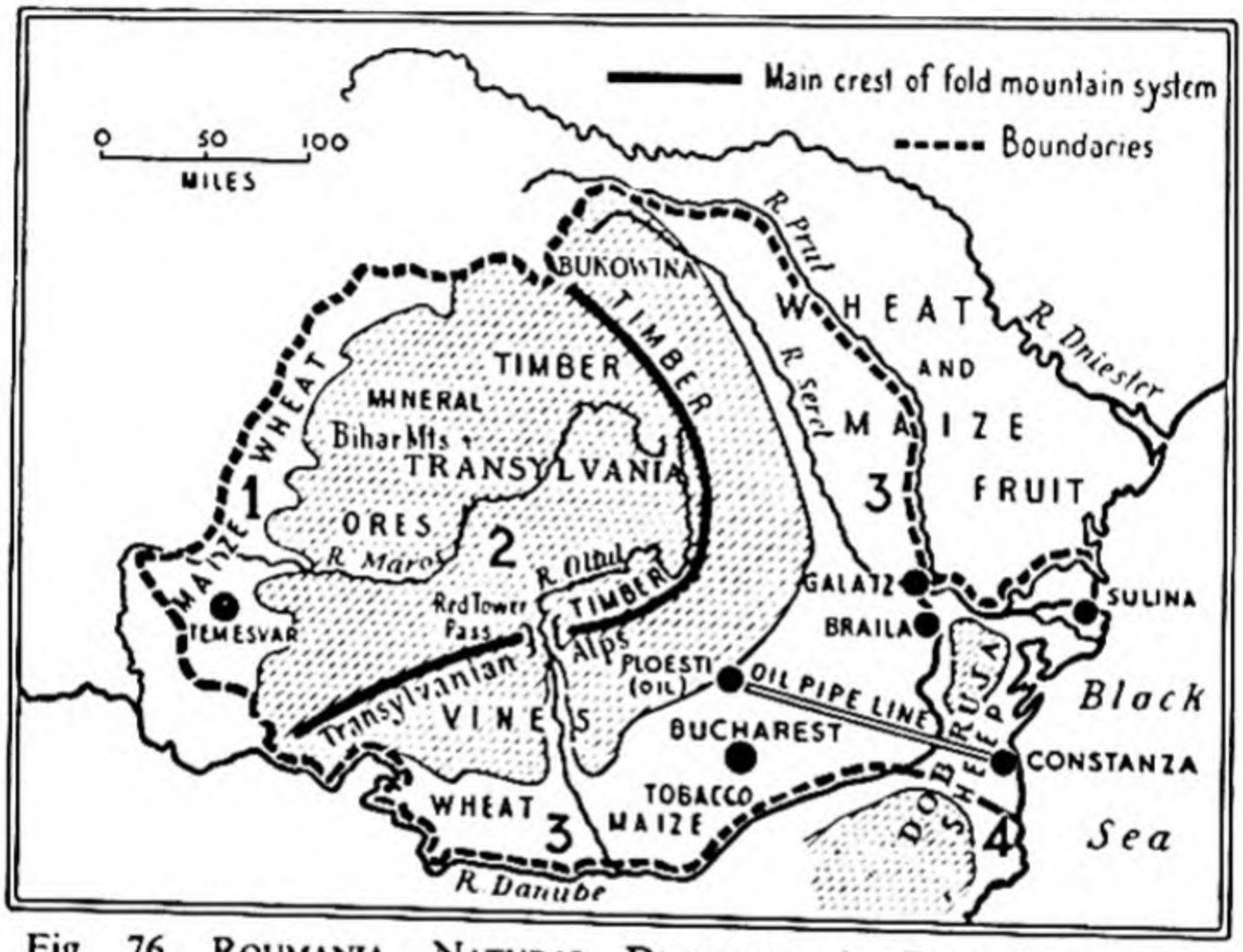


Fig. 76. ROUMANIA. NATURAL DIVISIONS.—1. Danubian Plains. 2. Highland region. 3. Eastern and Southern Plains. 4. Dobruja.

land is used for the production of maize, wheat and sugar-beet. Production of bread grains is 4 million tons, of maize 6 million tons and of sugar-beet 3 million tons.

Roumania has a continental climate. The average temperatures of Bucharest range from 75° F. (*24° C.*) in July to 25° F. (*—4° C.*) in January, though the actual temperatures may rise to 100° F. (*38° C.*) in summer and fall below zero in winter. The average rainfall, like that of the plains of Hungary and Yugoslavia, is about 25 inches, of which 15 inches fall in the summer half-year.

Natural Divisions

Roumania (Fig. 76) consists of—

(1) A small section of the Hungarian plains to the west of Transylvania.

(2) Transylvania—part of the great Alpine system of Europe.

(3) The low plains to the east of Transylvania, which extend to the River Danube in the south and to the River Dniester in the east.

(4) The low plateau of the Dobruja.

(1) THE WESTERN PLAINS.—In this region, which is structurally and climatically part of the Hungarian Alfold, are the most productive agricultural lands of Roumania. Here are obtained the highest yields of wheat and maize and in addition rice, tobacco and grapes are cultivated. The chief town, Temesvar, has small metal industries.

(2) TRANSYLVANIA.—Transylvania consists of a plateau basin surrounded by the Carpathian arc and the Bihar Mountains. Within its borders rise the River Maros which drains westward to the Danube, and the River Oltu which flows southward through a deep gorge (the Red Tower Pass) in the Transylvanian Alps, so linking the plateau with the plains of Walachia.

Much of Transylvania is rich in forests of beech and oak, with conifers at higher altitudes. The wood is floated down the rivers to the saw-milling centres of the plains, the chief being Galatz. Much of the wood is exported to neighbouring countries which lack good timber supplies, and if properly exploited the Transylvanian forests would be of great economic value. The mountains are known to be rich in minerals such as iron, copper, lead, zinc, etc., but the output is small. In the river valleys wheat, corn and other crops are grown, and on the south-facing slopes there are vineyards and orchards. The pasture lands (*plaiuri*) above the tree line of the Carpathians are used for the grazing of animals in the summer (cf. the alps of Switzerland and the saeters of Norway).

(3) THE EASTERN PLAINS.—On the south and east the Carpathians drop gently to extensive plains. Walachia is the region to the south of Transylvania and drained by numerous

streams tributary to the Danube. Moldavia and Bessarabia lie to the east of the Carpathians and are drained by the Prut and the Seret.

Structurally, these regions are a westward extension of the plains of South Russia and are composed of fertile black earth or covered with rich deposits of loess. These are the great grain-growing regions. In addition to wheat and maize, barley is extensively cultivated in Bessarabia, and throughout the plain, tobacco, sugar-beet and grapes are grown in relatively small quantities.

At Ploesti, on the northern edge of Wallachia, there are oil deposits (see plate facing page 176). Roumania ranks as eleventh world producer of petroleum with an output of over 12 million tons (1960), and an oil pipe-line connects Ploesti with Constanza on the Black Sea. Formerly exported to Western Europe, most of this oil now goes to the U.S.S.R. Large amounts of natural gas are also obtained.

Bucharest (1,250,000), situated near the centre of the Wallachian plain, is the capital of Roumania. Railways connect it with other parts of the country, but it is not a natural route centre comparable to many of the other Danubian capitals.

Braila (100,000) and *Galatz* are river ports situated at the right-angled bend of the Danube and are engaged in the export of grain via the River Sulina, the only distributary of the Danube delta navigable for large ships.

(4) THE DOBRUJA.—The Dobruja is a low limestone plateau covered in part with fertile deposits of loess. For many years a poor and scantily-populated steppe region, devoted to the rearing of sheep, it is now being settled and cultivated. To the west of the Dobruja are the wide swamps of the lower Danube. To cross these swamps the Bucharest-Constanza railway bridge at Cernavoda is ten miles long.

Trade and Transport

Cereals (maize, wheat and barley), oil and timber together formerly account for nearly 80 per cent. of the exports of Roumania. It is claimed that as a result of post-war industrialisation on Soviet lines, that an appreciable and growing proportion of Roumania's exports now consists of manufactured articles. Nearly all her trade is with the other countries

of the Soviet bloc. Grain is also sent via the Black Sea to Western Europe, *e.g.* France and Britain. Practically the whole of the import list consists of various types of manufactured articles, viz. textiles, machinery, motor-cars, leather goods, etc.

The Danube is an important trading highway especially in relation to the wheat trade. But navigation on the Danube is restricted owing to the river being ice-bound for three months each year. On the Roumanian side the banks of the river are low and bordered by extensive swamps so that ports are difficult to construct and there are consequently few towns.

BULGARIA

Position, Climate and Resources

Bulgaria lies to the south of the lower Danube, and is one of the poorest countries of South-Eastern Europe. In area it is nearly half the size of Great Britain, but the total population is less than eight million (compare London with over eight million people). Special facilities have been granted for trade through Dedeagach, the port at the mouth of the River Maritza (Fig. 77).

Climatically Bulgaria is transitional between the Mediterranean and continental types. In the south of the country especially, modified Mediterranean conditions prevail as is shown by the winter temperatures—40° F. (*4° C.*) as compared with 15° F. (*−9° C.*) in Roumania—and by the large percentage of winter rainfall (20 inches in winter out of an annual total of 28 inches). The southern valleys of Bulgaria are sheltered from the continental influence of Russia by the Balkan Mountains. In contrast, Sofia, in the north-west of Bulgaria, has more continental conditions with a summer maximum of rainfall and much colder winters.

Bulgaria is largely an agricultural country, although the Communist régime is developing industries, particularly chemical and metallurgical industries. Mineral resources include brown coal (15 million tons in 1960), lead, zinc and especially copper ores, and a little oil.

Natural Divisions

Bulgaria falls into three distinct regions (Fig. 77)—

(1) The Balkan Mountains.

(2) Central Lowland.

(3) The Rhodope Mountains.

Fig. 77. BULGARIA.—1. The Balkan Mountains and the northern lowlands bordering the Danube. 2. The Central Lowlands. 3. South-Western Highlands.

(1) THE BALKAN MOUNTAINS.—This highland region is a broad limestone plateau rising to over 8,000 feet and extending west to east through the northern half of the country. Structurally it is part of the Alpine system of South Europe. It is crossed by deep gorge-like valleys such as the Shipka Pass and

the Isker Defile which is followed by a railway linking Sofia with the Danube at Nikopoli.

In the valleys of the northern slopes agriculture is the chief occupation and, as in the neighbouring country of Roumania, the chief crops are wheat, maize and barley. On the grasslands of the plateau sheep are reared. On the Bulgarian side of the Danube the highland often approaches closely to the river so that there are excellent sites both for the development of river ports and for defence. This is a strong contrast to the low and swampy river banks of Roumania.

(2) THE CENTRAL LOWLAND.—South of the Balkan Mountains is a lowland area occupied in its western half by the upper valley of the River Maritza. This lowland is the most fertile and productive area in Bulgaria. Because of its favourable climatic conditions the agriculture of this lowland is very different from that of Northern Bulgaria. Here are grown fruits, vines, tobacco, sugar-beet, roses and mulberry trees for feeding silkworms. The cultivation of roses in the vale of Kazanlik is one of the most interesting features of Bulgarian agriculture. Attar of roses is distilled from the blooms and forms an important and valuable article of export.

Burgas (75,000), on the Black Sea at the eastern end of the central lowland, is the chief port of Bulgaria, though the Greek port of Dedeagach, near the mouth of the Maritza, is the more natural outlet.

(3) THE RHODOPE MOUNTAINS.—In the south and west of Bulgaria is a mountainous area composed of ancient rocks and similar in structure to the highlands of Central Europe, *e.g.* the Bohemian plateau. This is the Macedonian Block or Rhodope Mountains. It rises to nearly 10,000 feet and is the most undeveloped and backward part of Bulgaria. This region was once well wooded, but the timber reserves have been depleted by ruthless cutting. Agriculture is the chief occupation, but the methods are primitive. The people are a hardy mountaineer type and have little contact with the outside world.

Sofia (700,000) and *Plovdiv* (Philippopolis, 160,000) are the only large towns in Bulgaria. The capital, Sofia, is on the highland between the Morava and Maritza valleys, and controls routes (*a*) north-westward to Nish and Belgrade, (*b*) south-eastward along the Maritza valley to Constantinople,

(*c*) north via the Isker Defile to the Danube, and (*d*) south-westward over a pass in the Rhodope Mountains to the Struma valley and the Mediterranean.

Transport and Trade

There is relatively little foreign trade and what there is is almost entirely with the Soviet bloc. The chief exports are tobacco (which accounts for nearly half the total), eggs, maize, wheat, attar of roses and silk cocoons, but exports of machinery and consumer manufactures are beginning to increase rapidly. About two-fifths of the imports consist of machinery and equipment, but the fact that over half is fuel and raw materials indicates the growth of industry, while imports of food, although small, are increasing. The wheat and maize of the north of Bulgaria are exported chiefly via the river port, Ruschuk. The Danube, however, is frozen for three months so that Varna (120,000) and Burgas on the Black Sea have considerable grain trade. One of the disadvantages of Varna and Burgas is that they are situated on a sea (the Black Sea) which is nearly landlocked. The outlet from this sea to the Mediterranean is controlled by another country, Turkey. Bulgaria makes little use of the facilities provided at the port of Dedeagach, which gives direct access to the Mediterranean, as most of her trade is with the U.S.S.R.

ALBANIA

General Characteristics

Albania is a small state about one-third the size of Scotland. It is situated on the east side of the Adriatic between Yugoslavia and Greece. It is one of the most backward and undeveloped regions of Europe, and it is inhabited by a virile and somewhat pugnacious people.

The coastal plains have a Mediterranean climate, and olives, vines, mulberries and cereals are grown. Parts of the plains are unhealthy swamps similar in type to those of Italy. The interior is a region of wild, inaccessible mountains where communication is extremely difficult. The country contains no railways and the roads are generally poor. Tirana (30,000), the capital, is about as big as an English market town. Other towns of relative importance are Scutari, Durazzo and Valona, but they all resemble straggling villages rather than urban centres.

Political

Albania, for many centuries under the nominal control of Turkey, regained its independence after the Balkan Wars of 1913. In 1918 the territory was claimed by both Yugoslavia and Greece, but its independence was maintained. By the raising of loans in Rome for the organisation and development of Albania, Italy acquired so much influence that the country was virtually an Italian protectorate. In April, 1939, Italy invaded Albania, proclaimed her king the ruler of the country, and appointed a Lieutenant-Governor, thereby acquiring complete control of the Adriatic Sea, and a possible base for attacking the Balkan peninsula, which she proceeded to do in the following year.

Later the role of protector passed to the U.S.S.R. but relations between the two countries are now very strained.

EUROPEAN TURKEY

Turkish Power in Europe

During the sixteenth and seventeenth centuries Turkish power was so great in South-Eastern Europe that the Turkish Empire included all the Balkan peninsula, Roumania and Hungary. In 1683 the northward advance of the Turks was checked near Vienna and from that date Turkish power in Europe began to wane. Throughout the nineteenth century their European territory dwindled, and still more was lost as a result of the Balkan Wars of the early twentieth century. Lastly, as a result of the 1914-18 War, Turkey in Europe was limited to a small area (about half the size of Scotland) in the immediate hinterland of Istanbul (Constantinople). The importance of the territory lies in its strategic significance rather than in its economic value.

Position and Strategic Importance

European Turkey lies between the River Maritza and the Black Sea. It is separated from Asiatic Turkey by the narrow straits called the Bosphorus, the Sea of Marmora, and the narrow Dardanelles. This narrow sea passage links the Mediterranean with the Black Sea.

Istanbul (1,000,000), on the north shore of the Bosphorus, has a unique position at the intersection of two great world routes:—

(*a*) The sea route from Russia to the Mediterranean, and

(*b*) The great overland route from north-west Europe to the Persian Gulf (known in Europe as the Orient Express route, see Fig. 22). Once it was the capital of the Eastern Roman Empire, and later the capital of the Ottoman (Turkish) Empire, and the centre of the Mohammedan religion. It has been replaced by *Ankara* (Angora) as the capital of Turkey, and its commercial importance is much less than formerly, since much of the Turkish trade is now handled by Smyrna.

The European mainland of Turkey has been seriously depopulated by the emigration of Greek subjects to Macedonia. *Edirne* (Adrianople) (35,000) is much less important than formerly because of the poor development of the surrounding area. The European plains of Turkey are rather dry and largely composed of steppe-like country used for sheep and goat pasture. Agriculture is backward but small quantities of cereals and fruits are grown.

CHAPTER XVI

THE MEDITERRANEAN REGION

Routes from the Mediterranean Sea

The Mediterranean Sea, the largest inland sea in the world, extends for over 2,000 miles from the Straits of Gibraltar eastward to Palestine. It falls naturally into two basins separated by a submarine ridge joining southern Italy and Tunisia. From this ridge rise the islands of Sicily and Malta, occupying an important strategic position between the two Mediterranean basins.

The western basin is surrounded on all sides by high mountains of the Alpine system and within it lie the Balearic Islands, Corsica and Sardinia. Routes from this basin occur where there are breaks in the mountain girdle, viz. (Fig. 78)—

(1) The Straits of Gibraltar which link the Mediterranean with the Atlantic.

(2) The Gate of Carcassonne between the Pyrenees and the Central Plateau of France.

(3) The Rhone corridor from Marseilles to Northern Europe.

(4) The Bochetta pass behind Genoa leading to the northern plain of Italy and via the Alpine passes to northern and central Europe.

(5) The Straits of Messina and the Straits of Sicily leading to the eastern Mediterranean basin.

(6) The Alpine passes.

The eastern basin is bordered by mountains on all its sides except the south between Suez and Tunisia. The routes from this basin are—

(1) The Straits of Messina and the Straits of Sicily leading to the western basin.

(2) The Vardar-Morava valleys from Salonika to Belgrade.

(3) The Dardanelles, Sea of Marmora and Bosphorus linking the Mediterranean with the Black Sea.

(4) The Aleppo-Antioch route of northern Syria leading to Iraq and the Persian Gulf.

(5) The Suez Canal linking the Mediterranean with the Red Sea and Indian Ocean.

The latter is the most important outlet and forms part of one of the greatest trading routes of the world. Gibraltar, Malta and Port Said are the three "key" positions of the Mediterranean. The first two are strongly fortified British naval bases and all three are important refuelling stations.

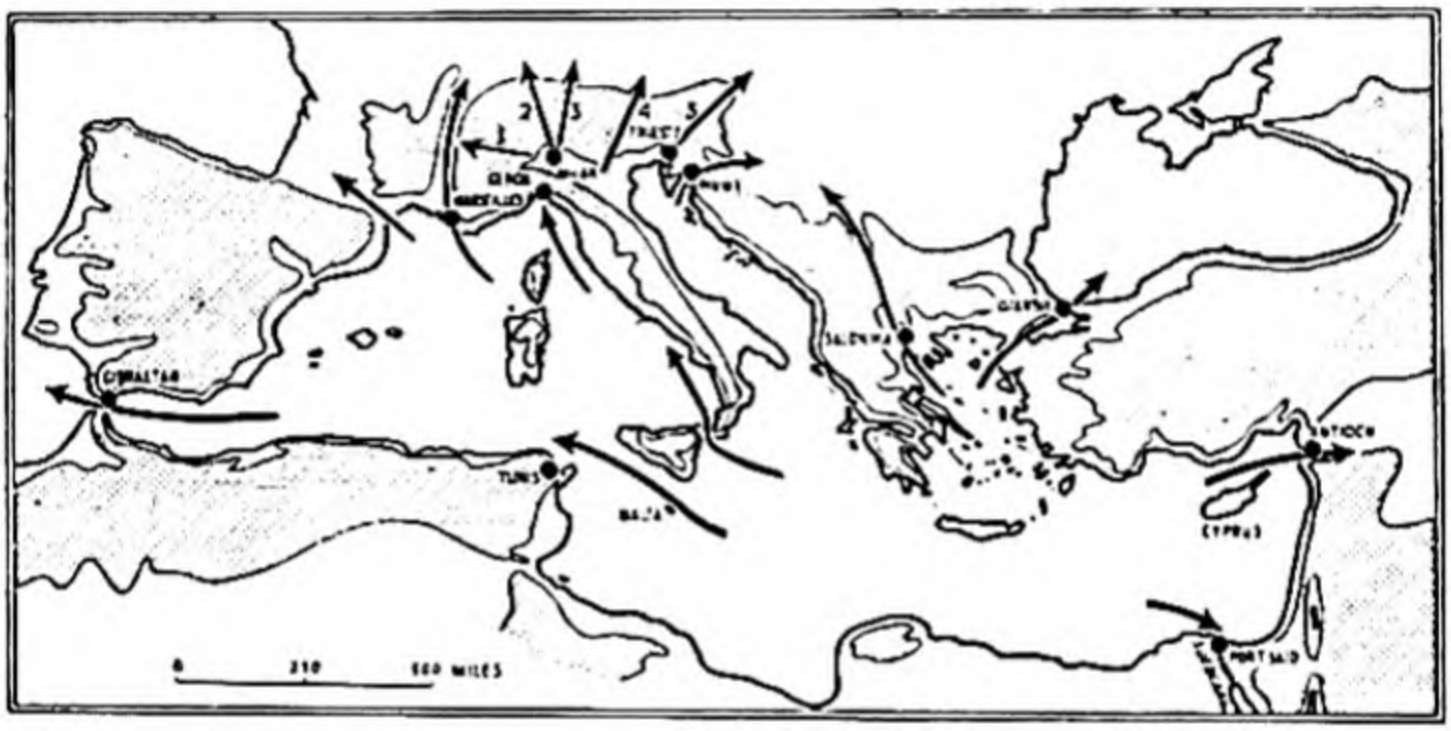


Fig. 78. THE PRINCIPAL NATURAL ROUTES FROM THE MEDITERRANEAN SEA.—1. Mount Cenis. 2. Simplon. 3. St. Gothard. 4. Brenner. 5. Semmering. Note the importance of the position of Cyprus in relation to the routes to the Indian Ocean: (*a*) via Antioch and Iraq, (*b*) via Port Said and the Red Sea.

Historical Significance of the Mediterranean

The Mediterranean has played an important part in history, for around its shores the first great empires were established, each in turn playing its part in the cultural development of the world. Some of the great empires which at various periods dominated lands bordering the Mediterranean were the Egyptian, Phoenician, Persian, Assyrian, Greek and Roman empires. The Roman Empire at one time ruled all the lands bordering both the eastern and western Mediterranean which virtually became a " Roman Sea."

In the Middle Ages, the Mediterranean was the scene of the struggle between Christianity and Mohammedanism and

though the Moors were ultimately driven from Spain, Mohammedanism still flourishes along the southern and eastern shores. Immediately following the period of the Crusades the Mediterranean was the highway for trade with the East, spices, silks, etc., being brought overland from the Indian Ocean to the eastern Mediterranean. It was during this period that Venice and Genoa became great trading cities. From these ports Eastern merchandise was distributed to the lands of northern Europe. The coming of the Turks and consequent closing of the land routes to the Indian Ocean led to the voyages of the " Period of Discovery." The use of the Cape route was a severe blow to Mediterranean trade and for some centuries the Mediterranean was relatively unimportant as a trade route. The cutting of the Suez Canal in 1869 once more made the Mediterranean a great trade highway.

Mediterranean Sea compared with the Baltic Sea

The Mediterranean Sea differs in many ways from the other great inland sea of Europe, viz. the Baltic.

(1) While both seas extend eastward along the margins of peninsular Europe, the Baltic Sea being farther north is subject to much lower temperatures.

(2) Both seas have a very low tidal range due to their narrow connections with the open ocean. The tidal range of the Mediterranean is often less than one foot. The absence of tides and tidal currents to carry away silt results in the formation of deltas, viz. Ebro, Rhone, Po and Nile. There are, therefore, no important ports at the mouths of the rivers flowing into the Mediterranean Sea.

(3) Both seas have been important as trading centres (*e.g.* the Hansa trading towns of the Baltic). The Baltic Sea, however, is a cul-de-sac and the Mediterranean is a trading thoroughfare. The chief commodities of Baltic trade are flax, dairy produce, timber and wood products, but the trade of the Mediterranean is concerned with fruits, wine, grain and a great variety of products from the East, viz. petroleum, tea, rice, silk, rubber, vegetable oils, etc.

(4) The Baltic Sea is fed by a larger number of rivers of constant flow. Thus the supply of fresh water is greater

The Baltic, therefore, has a low salinity while the Mediterranean Sea is very salty. The relative freshness of the Baltic waters, coupled with its low winter temperatures, causes the Baltic to be icebound during the winter months (see page 86).

(5) Owing also to the variations in salinity, surface currents of relatively fresh water (less dense) flow *out* of the Baltic to the more saline Atlantic. On the other hand surface currents flow *into* the Mediterranean from the Atlantic and the Black Sea because the water of the Atlantic Ocean and Black Sea are less salty than those of the Mediterranean.

(6) Whereas the Mediterranean is nearly encircled by high mountains the Baltic Sea is bordered by wide, low plains.

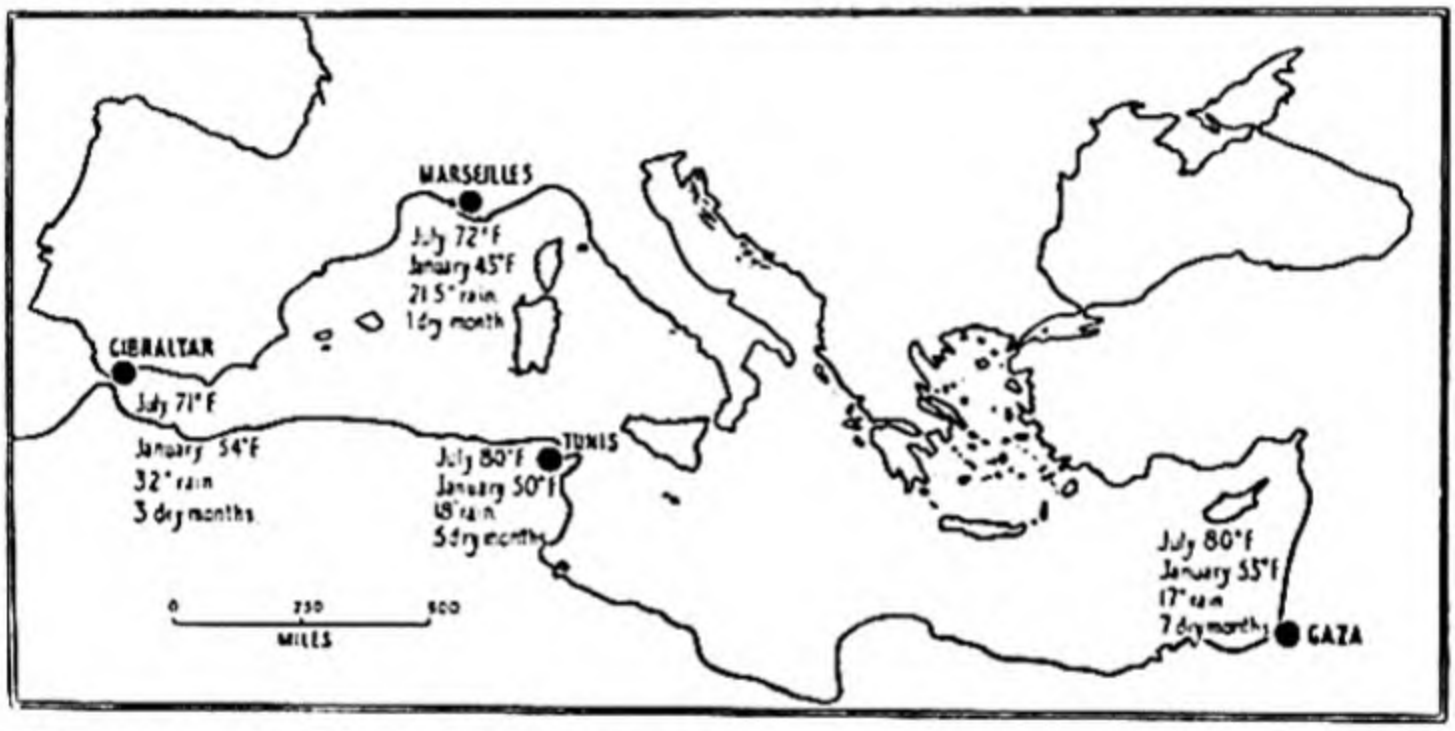


Fig. 79. CLIMATIC VARIATIONS IN THE MEDITERRANEAN BASIN.—In the figures given a dry month denotes one with less than one inch of rain.

Climate

The lands surrounding the Mediterranean Sea all have such a characteristic climate that lands in other parts of the world with similar climatic conditions are said to have a Mediterranean climate. In general, the climatic conditions are hot summers [70° F. to 80° F. (*21° C.* to *27° C.*)], warm winters [45° F. to 55° F. (*7° C.* to *13° C.*)], sunny skies and about 25 inches of rain falling mainly in winter. Owing to the large extent of the Mediterranean Sea, however, there are many variations from the mean conditions, viz.:—

(1) Temperatures increase from the northern shores southwards (*e.g.* Marseilles to Tunis).

(2) Summer temperatures increase and winter temperatures decrease with distance from the open Atlantic, *i.e.* from Gibraltar to Palestine.

(3) Annual rainfall decreases and the number of dry summer months increases from north to south and from west to east. Figures indicating these variations are shown in Fig. 79.

British Interests in the Mediterranean Sea

The Mediterranean-Suez route is of fundamental importance as a link between Britain and the East, and especially as a sea route to India, East Africa and Australia. For this reason the British possessions of Gibraltar and Malta, and her military bases in Cyprus have great strategic significance (see Fig. 78).

Gibraltar, in the extreme south of Iberia, is a rocky peninsula separated from Spain by an uninhabited neutral zone. It is a strong naval base, guarding the entrance to the Mediterranean from the Atlantic (see plate facing p. 176).

Malta, a small island situated between Sicily and Tunis, guards the route between the western and eastern basins of the Mediterranean. Its chief town, Valletta, is situated on a ridge between two large natural harbours, and has an important dockyard and fuelling station. The spoken language is Maltese, derived from Arabic but English is used for reading and writing.

Cyprus, in the eastern Mediterranean, is an island with a population of about half a million, mainly Greek in extraction but with a considerable Turkish minority. It is mainly an agricultural country but copper and iron ores are mined for export and there is a considerable tourist industry. The mines, however, are likely to be exhausted within ten or twelve years. Formerly Turkish, the island was occupied by Great Britain in 1878. It is now a Republic within the British Commonwealth, with certain military bases in the island to be used by Britain. Since the war of 1939-45 malaria has been wiped out by large-scale spraying of the breeding places of the mosquitoes that transmit the disease.

Cyprus is an important centre for air routes to the East via (*a*) Antioch, Baghdad and Basra, and (*b*) via Cairo and Damascus. Nicosia (86,000) is the chief town and airport.

CHAPTER XVII

THE MEDITERRANEAN LANDS: (I) GREECE

General Characteristics

Greece is a country of mountains, peninsulas and islands. These islands, numbering some hundreds, are the tops of submerged mountain ranges which formerly linked Greece with Asia Minor. About two-thirds of the population are peasant farmers cultivating small holdings. But no part of the country is more than 80 miles from the sea so that from the earliest days of history Greece has been associated with the sea and with maritime activity. Even to-day the Greeks are great sailors and traders, and nearly half the inhabitants live in cities. The total population is nearly eight millions.

Though the Greek empire was so illustrious in the past, the political unit of modern Greece dates only from 1829 when the Turkish domination was overthrown. In early times Greek peoples and Greek culture spread to all the islands and shores of the Aegean Sea, and this distribution of the Greeks is still shown on an ethnographical map of Europe. As a result of the 1912-13 War, Greece regained Macedonia as far east as the River Evros (Maritza). The western coastlands of Asia Minor also became part of Greece, but as a result of a conflict between Turkey and Greece in 1922 the former country regained her lost territory and the Greek population was expelled.

Natural Divisions

Modern Greece comprises (Fig. 80)—

(1) The peninsula.

(2) The Macedonian coastlands.

(3) The islands.

(1) THE PENINSULA.—In the northern half the Greek peninsula consists of high ranges which are structurally a continuation of the Alpine folds bordering the east of the Adriatic Sea. Like the mountains of Yugoslavia they are largely composed of limestone. The chief range is

known as the Pindus Mountains which form a central backbone rising to over 8,000 feet. On either side of the Pindus Mountains lesser ranges branch out to the east and west enclosing small river valleys and lowland areas,

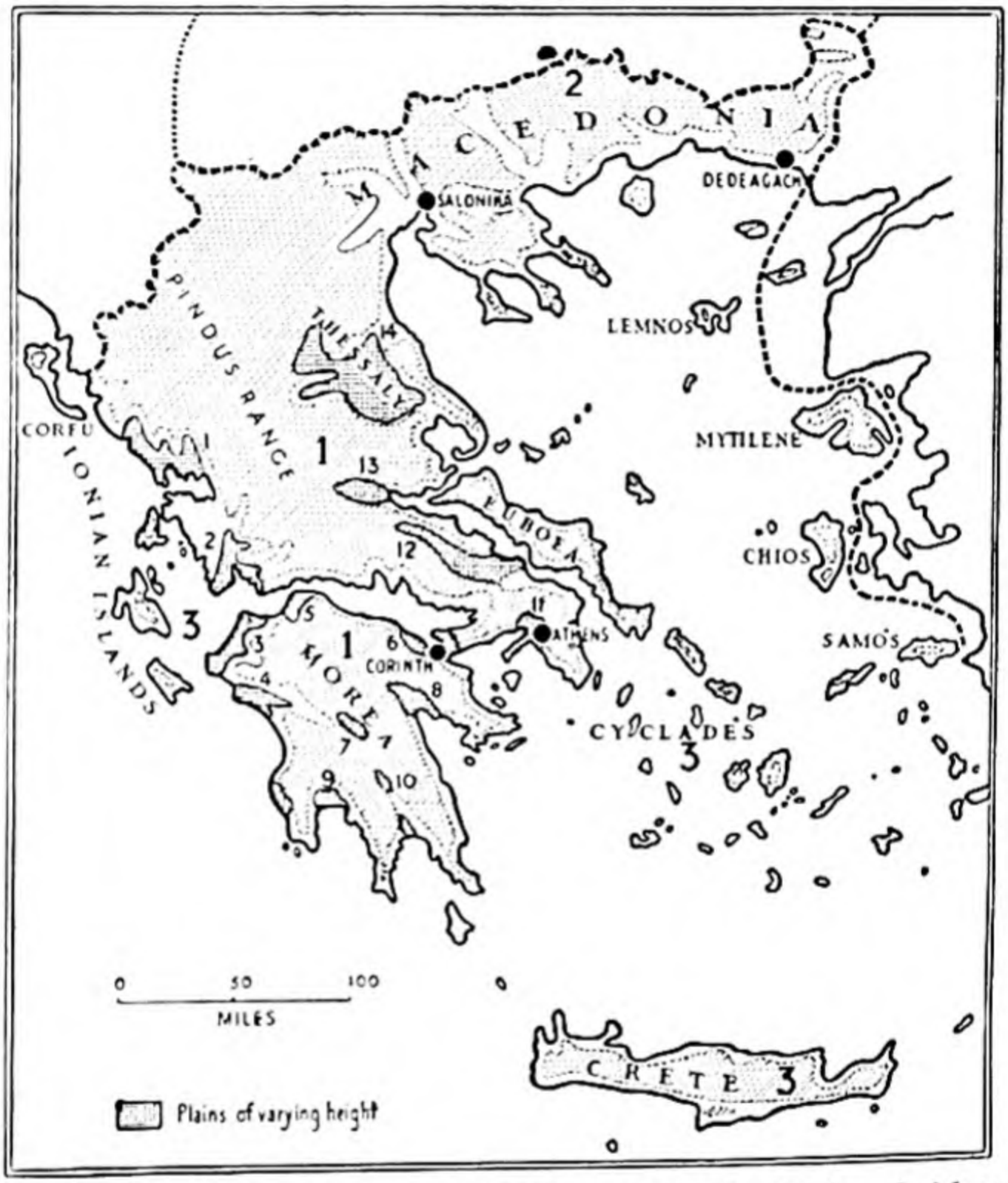


Fig. 80. NATURAL REGIONS OF GREECE.—1. The Peninsula. 2. Macedonia. 3. The Islands. PLAINS (of varying height): 1. Arta. 2. Aspropotamus. 3. Elis. 4. Olympia. 5. Achaea. 6. Corinth. 7. Arcadia. 8. Argos. 9. Messenia. 10. Sparta. 11. Athens. 12. Boeotia. 13. Thermopylae. 14. Thessaly.

e.g. the plains of Thessaly. The southern half of the peninsula consists of other long peninsulas separated by deep gulfs and is bordered by elongated islands such as Euboea. Morea is almost separated from the mainland by the Gulf of

Above Grain harvest in the valley of the Prahova with the Roumanian oil refineries at Ploesti in the background. (*Exclusive News Agency.*)

Below Gibraltar—the Rock. (*Ewing Galloway, N.Y.*)

Above. The outskirts of Athens. (*Aerofilms Ltd.*)

Below. Drying currants. (*Greek Embassy.*)

Corinth for the isthmus is only four miles wide. The Isthmus of Corinth is cut by the Corinth Canal which because of its narrowness (about 50 feet) can only be used by small vessels. The highlands of Greece were once heavily wooded, but extensive deforestation resulted in rapid soil erosion and the formation of malarial swamps in the lowlands, but irrigation and drainage works have now converted swamps into fertile agricultural land. The uplands are scantily peopled and used mainly for the grazing of herds of sheep and goats. Greece has more goats per square mile than any other country in the world. Where the small lowland valleys are cultivated the principal crops are vine, olives, tobacco and oranges. Small seedless grapes are grown, dried and exported as currants (see plate facing page 177). Up to 1914 Greece had a virtual monopoly of the world's currant trade, but large quantities are now exported from California and Australia. Wine and olive oil are exported. Thessaly, on the sheltered eastern side of the peninsula, is the principal grain-growing area. As in other Balkan countries, yields are poor and methods of cultivation primitive. Even before the great influx of Greek refugees (about 1,500,000) from Turkish and Bulgarian lands, Greece had to import about half the cereals she used. The chief towns are situated in the lowland valleys, separated from one another by mountain barriers. Many of these towns, such as Corinth, Argos, and Thebes, were the leading cities of ancient Greece. They are rarely situated on the coast but like Athens, the capital (1,400,000), stand some few miles inland, out of danger of attack from the sea and away from the unhealthy swamps of the river mouths.

Piraeus is the port of Athens, and Patras on the Gulf of Corinth is largely concerned with the currant trade.

(2) THE MACEDONIAN COASTLANDS.—The Macedonian section of Greece consists of a number of small coastal plains backed by highlands composed of ancient rocks. The highlands are used for the grazing of sheep and goats, while the lowlands, though formerly marshy and unhealthy, are now drained and cultivated. This region, until recently, was in a very backward state, chiefly because of its political vicissitudes, and the uncertainty as to its future. Since the war of 1914-18 many Greek refugees from Turkey and Bulgaria have settled

here, and it is now the most densely-populated area in Greece. Grapes, olives, wheat and even cotton and rice are grown, but the chief crop is tobacco which is to-day by far the most important article of export. The region is also of great importance in relation to routes, Salonika (300,000) controls the Vardar-Evros (Maritza) route to Belgrade and the Danube lands. Alexandroupolis (Dedeagach), near the mouth of the River Maritza, is well situated to handle Bulgarian trade.

(3) THE ISLANDS.—The islands of Greece include the Ionian Islands off the west coast; Crete; and all the islands of the Aegean Sea, except Imbros and Tenedos, which are Turkish.

Crete, a long narrow mountainous island, is part of the Alpine fold which links Greece and Asia Minor. The products are typically those of a Mediterranean area, viz. olives, vine, etc. The chief towns, Herakleion (Candia) and Canea, are on the more indented northern coast. The regular south coast provides few good harbours though it is more sheltered from the north winds.

The Cyclades, in contrast to the limestone formation of many of the other islands, are composed of ancient crystalline rock (cf. Corsica and Sardinia in the Western Mediterranean). The soil is poor and thin, but wherever possible crops are raised on the terraced south-facing slopes.

The Ionian Islands, part of a submerged outer range of limestone mountains, include Corfu, Cephalonia and Zante. Many of the people are fishermen, but, as on the other islands, vines, olives and oranges are cultivated on south-facing slopes.

The Dodecanese Islands were annexed from Italy after the war of 1939-45.

Although Greece has not yet developed a tourist industry comparable with that of Switzerland, her wealth of historic remains and associations is attracting an increasing number of tourists annually.

Tobacco accounts for one-third of Greece's exports, and dried fruit and cotton between them for another third. Other exports include mineral ores such as iron and manganese ores and bauxite. Imports consist of grain and other foodstuffs, fuel and manufactured articles.

CHAPTER XVIII

THE MEDITERRANEAN LANDS: (2) ITALY

Late Development of Italy

From the point of view of historical development Italy Is an old country, illustrious as the central realm of the Roman Empire. But after the fall of Rome, the Italian peninsula was for many centuries divided into a number of small states. It was not until the latter half of the nineteenth century that the political unit now known as Italy came into being.

To this late start Italy owes many of her present difficulties. Other European powers, first in the field, colonised the most valuable portions of the "new lands." Italy had, perforce, to be contented with the semi-arid and relatively unproductive lands of Eritrea, Somaliland and Tripoli, which were acquired early this century. But during the last two or three decades the population of Italy has increased rapidly and is now over forty-seven million. In view of the large percentage of mountain land and unhealthy swamp in Italy, the country is over-populated (380 per square mile). Lacking suitable colonial areas for expansion the Italian peoples have been emigrating in large numbers to most of the countries of South America, especially South Brazil and Argentina, and to Tunis, Egypt and California.

Natural Divisions

Italy may be considered as consisting of three major divisions, viz. (Fig. 81):—

(I) The Northern Plains and the mountains which encircle them on all sides except the east where the plain is open to the Adriatic Sea.

(II) The long narrow peninsula which extends far southward into the Mediterranean. The Appennines, which form the backbone of this peninsula, are part of the Alpine mountain

system of Southern Europe, and link the Alps with the mountains of Sicily and the Atlas mountains of North Africa.

(III) The islands, the chief of which are Sicily and Sardinia.

Climate

The peninsular and insular sections of Italy have a climate which is typical of all Mediterranean lands, viz. very hot

Fig. 81. THE NATURAL DIVISIONS OF ITALY.—I. Northern Italy. II. Peninsular Italy. III. Insular Italy.

summers, warm winters, sunny skies, and moderate rainfall, the greater part of which falls in the winter months, the summer often being a period of drought.

The northern plains, shut off from sea influences by the encircling mountains, have a climate which is not Mediterranean in type, but which has many continental characteristics, viz.

colder winters, greater extremes of temperature and a far greater proportion of the annual rainfall during the summer months (Fig. 82). The following figures show the salient climatic differences between continental and peninsular Italy.

Place	Temperature (F. and C.)			Rainfall		
	July	Jan.	Annual Range	Total	Winter	Summer
Naples	76° (*24°*)	47° (*8°*)	29° (*16°*)	33″	23″	10″
Milan	75° (*24°*)	32° (*0°*)	43° (*24°*)	40″	19″	21″

Fig. 82. Italy. Climatic Regions.

Milan, some 300 miles farther north, has a July temperature nearly as high as that of Naples, while the winters are 15 F.° (*9 C.°*) colder. Less than one-third of the total rainfall of Naples falls in the six summer months, while at Milan more rain falls during the six summer months than during the six

winter months. The heavier summer rainfall of the northern plains gives rich pasture land, suitable for the rearing of cattle. Typical Mediterranean areas, owing to the dry summer conditions, have no good cattle pasture and are therefore generally more important for the rearing of sheep and goats.

The Northern Plains: Physical Features

The northern lowland of Italy is an alluvial plain, drained by the River Po and its tributaries. Originally this region was a continuation of the Adriatic Sea, and the plain was formed by the deposition of sediment brought down by the swift Alpine streams. This great lowland is still being extended eastward, for it has been estimated that new land is being added at the seaward end of the Po delta at the rate of nearly 400 acres per annum. Adria, now some twelve miles inland, was a seaport in Roman times. In its lower course the river has raised its bed above the level of the surrounding plain. This facilitates irrigation but the banks of the river have had to be strengthened to prevent flooding. The River Po lies in the southern half of the plain nearer to the Apennines than to the Alps. This is because the Alpine tributaries, such as the Ticino, Adda and Mincio, are of greater volume and more swiftly flowing than the tributaries from the Apennines.

On the west and the north of the plain the Alps rise very steeply, but on the south the Apennines have a more gentle gradient. In the northern mountains are a number of beautiful lakes, viz. Maggiore, Lugano, Como and Garda, some of which, like the lakes on the northern side of the Alps in Switzerland, were formed by glacial action. To the south of the Alps are extensive areas of morainic hills rising to nearly 2,000 feet (*e.g.* near Ivrea). Between these morainic heights and the River Po stretches a flat alluvial lowland.

Reasons for the High Development of Northern Plains

The northern plains are the most highly developed and most densely peopled section of Italy. This is due to a number of factors, viz.:—

(1) The fertility of the alluvial soil.

(2) The climatic conditions which are favourable for the cultivation of a large variety of crops.

(3) The ease of irrigation especially in the eastern half of the plain where the rainfall is least.

(4) The accessibility of the plain in spite of the mountain girdle, because of the number of passes through the mountains.

(5) The swift streams which have facilitated the development of abundant supplies of cheap electric power. (Four-fifths of Italy's electricity is hydro-electric.)

(6) The large supplies of cheap and efficient labour.

Agriculture in the Northern Plains

The first three factors enumerated above have helped to make the northern plains the richest agricultural region of the country. Agriculture is of the intensive type and land is often used for production of three crops side by side, viz. fruit trees, vines and vegetables, *i.e.* "three tier" culture. Several crops per year are obtained from much of the cultivated land.

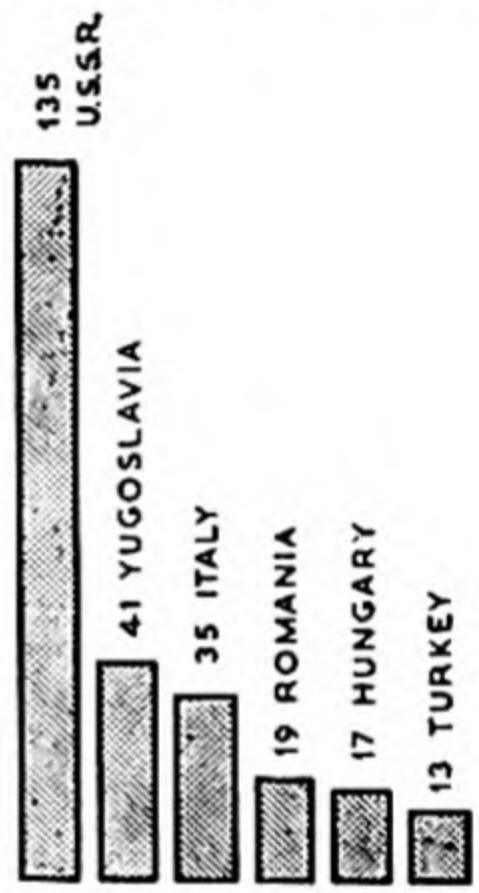


Fig. 83. PRODUCTION OF HEMP IN THOUSANDS OF TONS (1956-8)

This region produces all the rice grown in the country and nearly all the hemp (Fig. 83), over three-quarters of the silk, nearly three-quarters of the maize, almost half the wheat and wine and three-quarters of the cattle. Rice can be grown because of the hot summers and the abundant supplies of river water for irrigation. The rice crop is large enough to allow a surplus for export. Much of the maize is used as human food, and it also forms the basis of an extensive poultry-rearing industry.

Because butter is little used in Mediterranean lands, the dairying industry is mainly concerned with the manufacture of cheese, *e.g.* Gorgonzola and Parmesan. Wheat, used for both bread and macaroni, is a very important crop. Owing to more careful cultivation the yields per acre (13 cwt) in the northern plains are much higher than those (7 cwt) of Southern Italy. Though Italy devotes a greater proportion of land to wheat cultivation than any other country (even including France) she only produces about three-quarters of her needs. The most important crop of Northern Italy is the

vine (see Fig. 33). The vineyards are principally to the north of the River Po and on the sunny south-facing slopes of the northern mountains. Some wine is exported to France, but in general the quality of Italian wines is not sufficiently high to enable them to compete with the French wines in the world markets. Mulberry trees, the leaves of which are used for feeding silkworms, are also grown most extensively on the

Fig. 84. DISTRIBUTION OF PRINCIPAL AGRICULTURAL PRODUCTS.

south-facing hill slopes, especially in the region between Lakes Maggiore and Garda. Italy produces 90 per cent. of the silk of Europe, and this is due not only to the suitability of the climate for mulberry production, but largely to the abundance of cheap labour needed for the reeling and throwing of the silk.

It should be particularly noted that olives are not cultivated in the northern plains. The olive is the most typical of all

Mediterranean products, and, as already noted, the climate of the northern plains is not Mediterranean in type, having winters too cold and summers too wet for olive cultivation (Fig. 84).

Industry in the Northern Plains

Not only are the northern plains a region of intensive agricultural development but they are the most highly

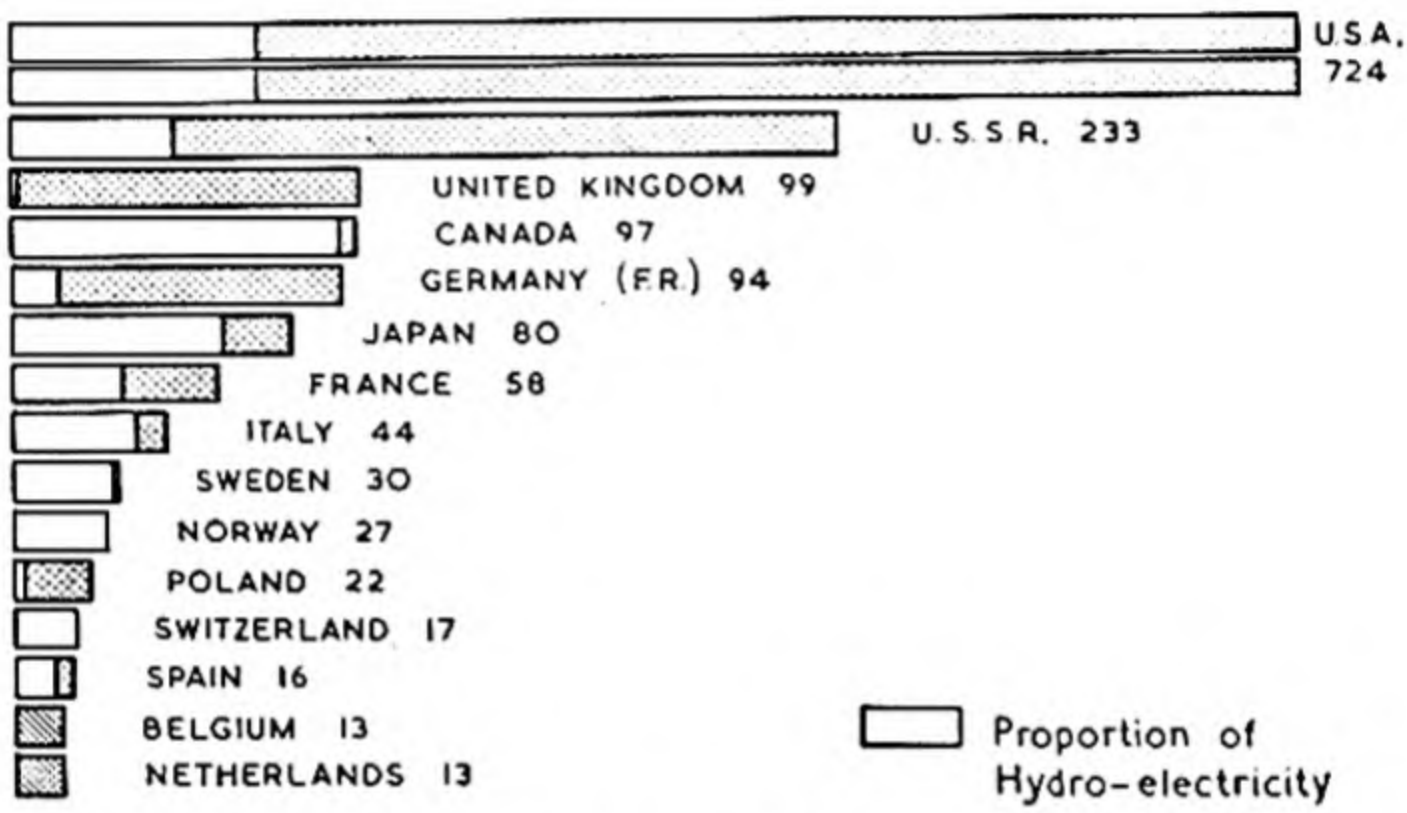


Fig. 85. PRODUCTION OF ELECTRICITY, 1958 (in thousands of millions of kilowatt-hours).—The unshaded portion shows the proportion of the total production that is obtained from water-power. In the case of France this is about 50 per cent. Production is almost entirely from coal in the United Kingdom, Poland, Belgium and the Netherlands, and almost entirely hydro-electric in the case of Norway, Sweden and Switzerland. Why is this? Russia, despite her large-scale hydro-electric schemes obtains by far the greater part of her electricity from coal and lignite. Canada is one of the few countries that export considerable amounts of electricity, which is taken across the border to the U.S.A., itself by far the world's greatest producer.

industrialised region of Italy. Italy is poor in coal and iron, although she produces considerable amounts of sulphur, zinc and lead, and also two-fifths of the world's mercury. Her chief coal deposits are in Istria, a province acquired from Austria after the war of 1914-18. This coal is not good coking coal and is of little value for metallurgical industries. Within the last few years, however, large

supplies of methane (natural gas) have been discovered in Emilia and are now piped to Milan, Turin and Genoa. Production in 1960 was equivalent to over 6 million tons of coal a year representing more than a quarter of Italian consumption of imported fuel. Oil has also been found in Sicily. There are small deposits of iron ore in Tuscany and Elba but the total output is only $\frac{1}{60}$ of that of France, and $\frac{1}{15}$ of that of Britain. Italy, then, is still without adequate supplies of two of the fundamentals for industrial development, and her progress in this direction has been in the face of formidable obstacles. Her manufactures must be based on imported raw materials (except for hemp and silk) but she has the two great advantages of an abundance of cheap and highly skilled labour, and unique facilities for the generation of hydro-electric power (Fig. 85).

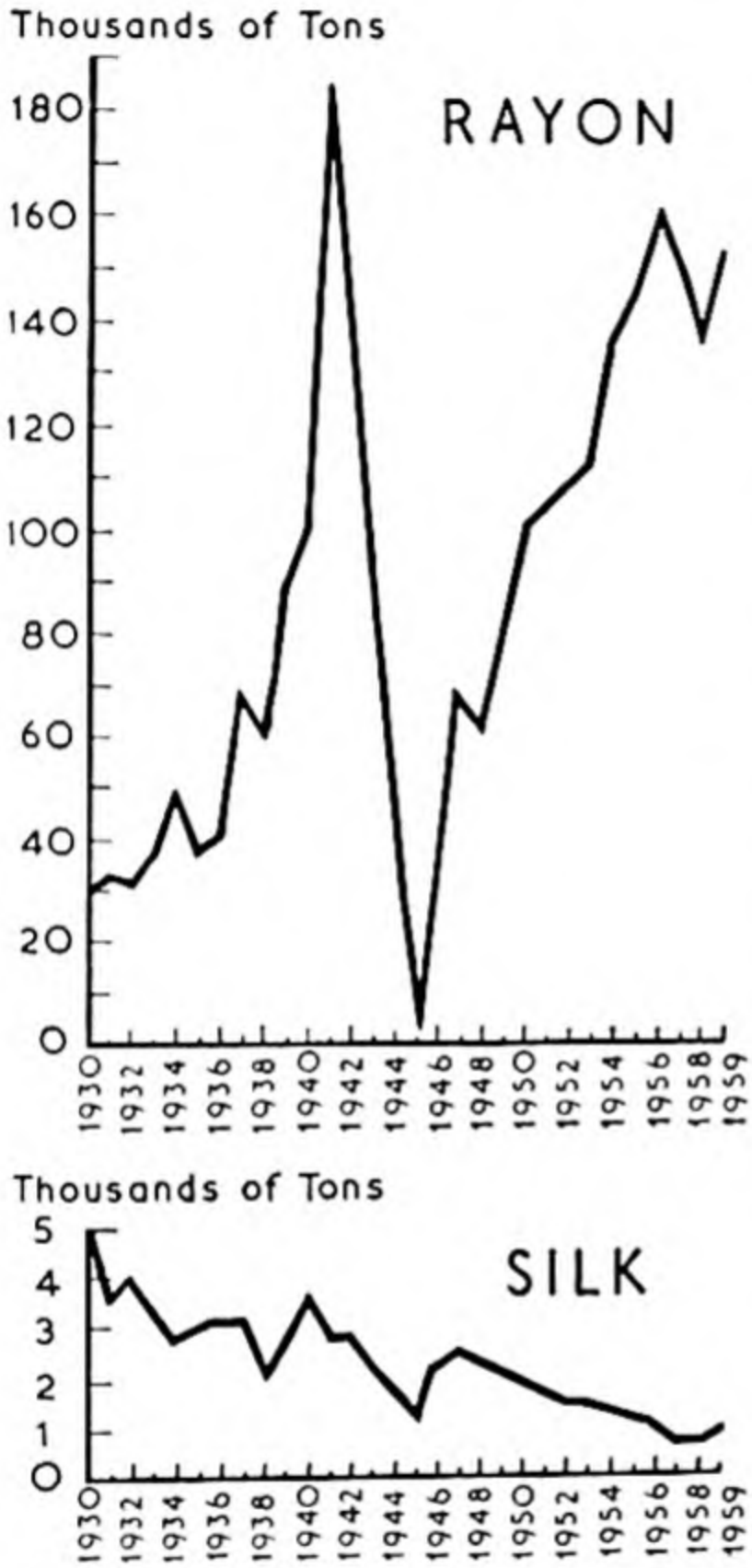


Fig. 86. ITALY.—Production of Rayon (above) and Silk (below) in Thousands of Tons. Note the effect on production of the War of 1939-45.

Her exceptional advantages with regard to the generation of electricity are due to:—

(1) The steep gradient and swift flowing streams of the Alps.

(2) The evenly distributed and heavy rainfall of the Alpine zone, which maintains the volume and steady flow of the steams.

(3) The lakes which act as reservoirs and also help to regulate the flow.

Italy has the largest output of hydro-electric power in Europe and 80 per cent. of this power is developed in the northern plains, especially to the north of Milan and the west of Turin. Available supplies are, however, almost completely developed.

Of the industries of the northern plain the manufacture of textiles ranks first and engineering second. The silk industry, for which Italy ranks first in Europe, is centred principally around Milan; Turin, Como, Bergamo and Verona are other centres. In recent years the manufacture of rayon has increased with phenomenal rapidity and the output is now one hundred and fifty times as great as that of pure silk, Italy ranking third in Europe and fifth in the world for rayon manufacture (Fig. 86). Whereas the pure silk industry is based on Italian supplies of silk, the rayon industry necessitates the importation of raw materials from Scandinavia and the countries of Central Europe. One type of rayon manufacture entails the use of sulphuric acid and for this the Sicilian supplies of sulphur are important. Other branches of the textile industry are the manufacture of cotton goods (Briella) and woollen goods (Brescia) both with mainly imported raw materials. The cultivation of hemp on the northern plains has given rise to a hemp industry and also to associated jute manufactures.

Metallurgical industries and engineering are also important in the cities of the northern plain. Turin, world famed for the manufacture of motor cars, is an Italian "Detroit."

Towns of the Northern Plain

The great towns of the northern plain were important long before the period of industrial development, and grew up primarily as trading centres. Thus they are situated where they can control routes across the mountains to northern Europe. Because of its liability to floods the lower course of the Po offered few attractive sites for settlement in the past, hence the largest cities are situated away from the river and are generally situated where plain and mountain meet, *e.g.* Turin, Milan, Brescia, Verona, Bologna and Parma.

Milan (1,300,000) is the greatest city of the northern plain and the second city of Italy (Fig. 87). It has important textile and engineering industries. As the " middle city of the plain " (Mediolaneum) it commands routes:—

(*a*) Northwards across the Alps, via (1) the Toce valley and the St. Gothard route, (2) the Ticino valley and the Simplon route.

(*b*) Eastwards along the northern edge of the plain via Verona and Padua to Venice.

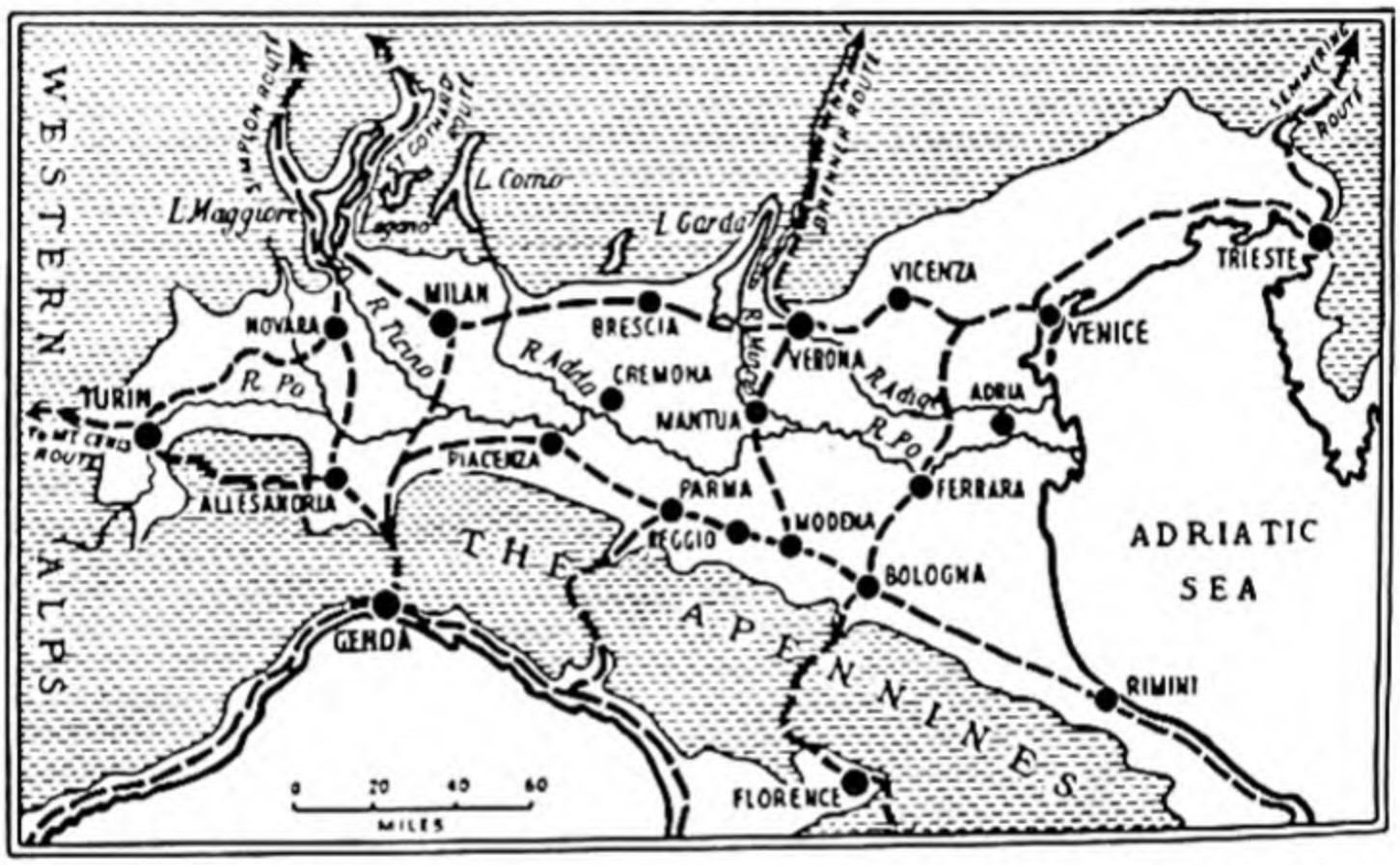


Fig. 87. THE CHIEF TOWNS AND ROUTES OF NORTHERN ITALY.—Note the three lines of towns: (*a*) Turin to Trieste along the north of the plain. (*b*) Turin to Rimini along the south of the plain. (*c*) The towns near the R. Po. Special attention should be paid to the positions of Milan, Turin, Genoa, Verona and Bologna as route centres.

(*c*) Southward across the plains and via the Col del Altare to Genoa and the Mediterranean.

(*d*) Westward via Turin and the Mt. Cenis route to Southern France.

Turin (850,000) is the western gateway of the plain. Situated on the River Dora Riparia, it controls the Mt. Cenis route across the Western Alps (Fig. 87). From it diverge two great east-trending routes:—

(1) The route along the northern edge of the plain via Milan and Verona to Venice.

(2) The route along the southern edge of the plain parallel to the Apennines. This railway route is parallel to the route of the Roman road known as the Aemilian Way and passes through Parma and Bologna. The two latter towns are situated where they command easy passes southwards across the Apennines.

Venice (320,000) was formerly one of the most important trading cities of the world. It lies to the north of the Po delta and occupies over 100 islands linked by 350 bridges. The original site was well suited for defence, and there, nearly a thousand years ago, at the time of the Hun invasions, a group of refugees settled. They became fishermen and traders. For many centuries Venice was a great entrepôt. Here were assembled the rich products of the East brought overland from the Indian Ocean to the Eastern Mediterranean. From Venice these goods were distributed to Northern Europe via Verona, the valley of the River Adige, and the Brenner Pass. The importance of Venice declined with the discovery of the "Cape" route, and the opening of the Suez Canal failed to restore it because of the high costs of overland transport. To-day Venice is a commercial backwater, but ranks high as a city of great beauty and historic interest.

Trieste (290,000) is situated at the extreme eastern end of the plain. Until 1914 it was an Austrian port (Fig. 87). It controls the important route across the eastern Alps:—

(*a*) To Villach and thence (1) northwards to South Germany and (2) north-eastwards via the Semmering Pass to Vienna.

(*b*) Eastwards to the Sava valley and the plains of the Middle Danube, *i.e.* to Budapest and Belgrade.

The population of the town is mainly Italian, but Slavs predominate in the country districts. The complexity arising from this distribution of population made it difficult to assign the town to either Italy or Yugoslavia. In 1954 the area claimed by both Italy and Yugoslavia, and for some years under United Nations control, was divided, the city and port going to Italy, and the surrounding area to Yugoslavia, a political arrangement which will undoubtedly prevent the port being used to the best economic advantage.

Genoa (700,000) is not situated on the northern plain, but it is, more than Venice, Trieste or Fiume, the great port of,

and natural overseas gateway to, the plain (Fig. 87). It is situated on the narrow coastal plain between the Ligurian Apennines and the sea. Behind it the Apennines are not only lower and narrower than elsewhere but are broken by two easy passes, the Col del Altare and the Bochetta Pass. Like Venice it was a great trading city and entrepöt of the Middle Ages, and declined in importance when trade to the East was diverted via the Cape route. But unlike Venice, it enjoyed a great revival of prosperity with the opening of the Suez Canal. All the raw materials and fuel (cotton, wool, timber, ores, coal and oil) for the industries of the northern

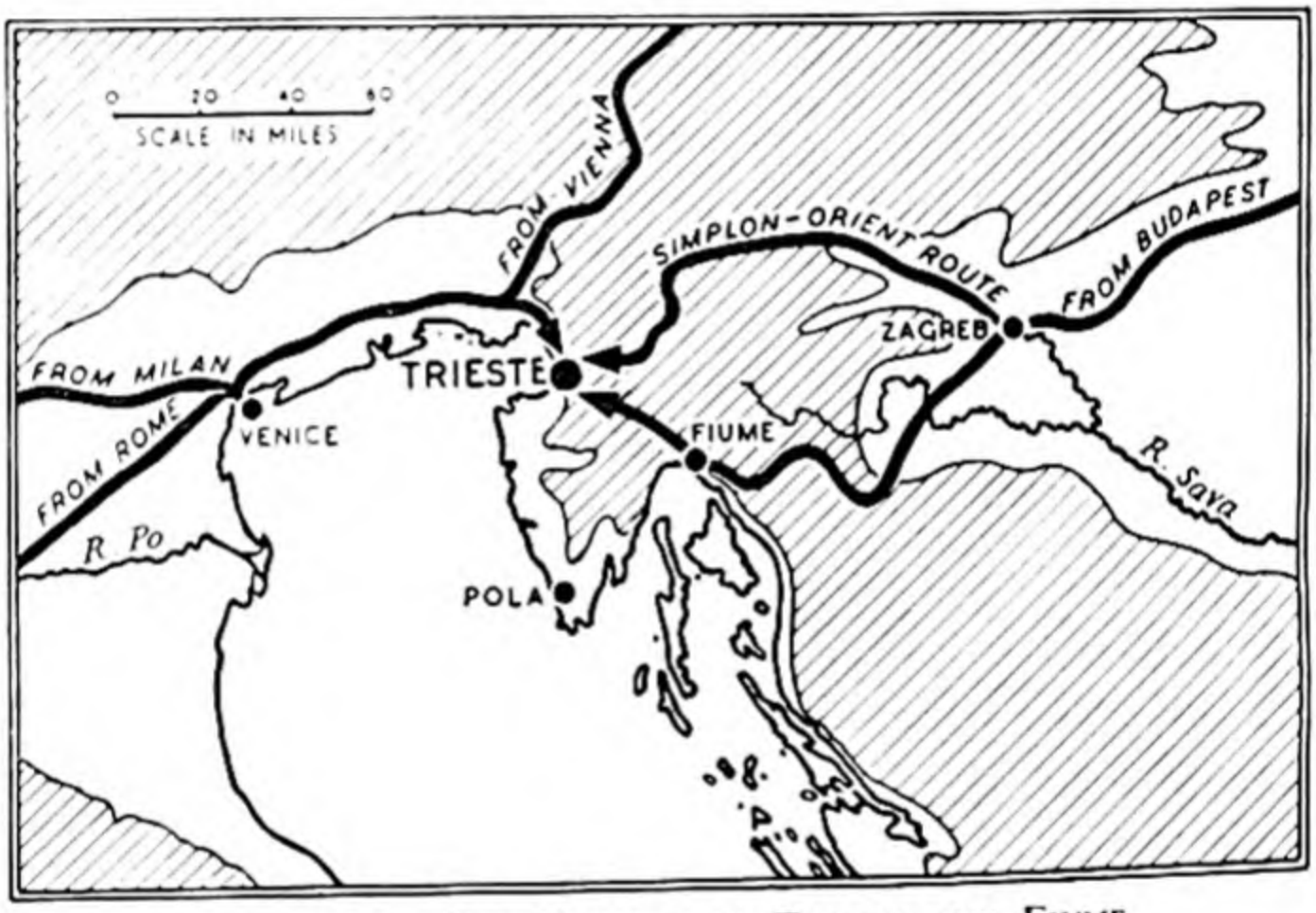


Fig. 87 (*a*). THE POSITION OF TRIESTE AND FIUME.

plains are imported through Genoa. The export of manufactured goods, however, is largely northwards via the Alpine passes, so that the import trade of Genoa is nearly six times as large as the export trade, which consists of articles of relatively small bulk, viz. fruit, wine, etc. An oil pipe line is being built from Genoa via Aigle (Switzerland) to Munich and Karlsruhe.

Peninsular Italy: Contrasted with Northern Italy

In very many ways Peninsular Italy contrasts sharply with Northern Italy.

(1) Northern Italy consists of an extensive plain, nearly surrounded by high mountains, but Peninsular Italy consists of high mountains with fringing plains.

(2) Southern Italy has a climate which is Mediterranean in type while in Northern Italy the climate is more continental in type (see page 181).

(3) Southern Italy is far less productive. Until the recent reclamation schemes were put into operation much of the lowland was unhealthy malarial swamp. Yields per acre are less than in the northern plains for the methods of farming are often extremely primitive, wooden ploughs and yokes of oxen still being used.

Whereas the farms of the north are small and intensively cultivated by peasant proprietors, much of Southern Italy is still in large estates on which the peasants work as labourers.

(4) In addition to cereals and vine, which are also extensively cultivated in the north, the peninsula of Italy grows large quantities of olives, oranges and lemons, fruits which are typical of Mediterranean conditions and which are adapted to withstand the dry heat of summer. Because of the summer drought pastures are brown and parched during the hot season. Cattle rearing is therefore of less importance than in Northern Italy, and the rearing of sheep and goats is a characteristic occupation of the southern upland areas.

(5) Southern Italy lies outside the industrial development of Northern Italy. Such industries as do exist are mainly those based on agricultural products such as the manufacture of olive oil, wine, macaroni and the drying of fruits. In Southern Italy there has been far less progress in the generation of hydro-electricity for the demand has not been so great as in the north. Also the mountains are lower, the streams less swift and less constant in volume, owing to the summer drought and the absence of lakes. In spite of these difficulties many schemes are now in operation especially in the regions round Rome and Naples, and it is hoped that electricity will be used more extensively in agricultural industries and in the work of draining the swampy lowlands. Recently, the discovery of several new gas fields in peninsular Italy and Sicily will aid the development of new industries in these areas.

(6) Though Southern Italy is much less densely populated than Northern Italy (see Fig. 23) it is, because of its lack of resources, less able to support its inhabitants. Hence the peasants of Southern Italy are generally poorer and more backward and illiterate than the people of the north. Fifty years ago, before the industrialisation of the northern plains, the majority of Italian emigrants were from that region, but to-day most Italian emigrants are natives of Southern Italy.

Divisions of Peninsular Italy

Peninsular Italy may be divided into three sections:—

(1) The Apennines.

(2) The western lowlands, from the River Arno to Naples.

(3) The south-eastern lowlands of the "heel" of Italy, viz. Apulia.

The Apennines

The Apennines are part of the Alpine system of fold mountains. They extend throughout the whole length of the peninsula, swinging in a great arc from Genoa to the "toe" of Italy. The lowlands of the peninsula fall into two groups, viz.:—

(1) The lowlands and river valleys (*e.g.* Arno, Tiber) within the mountain arc and on its western side.

(2) The Apulian lowlands on the south-eastern side of the mountains.

The Northern Apennines, extending from the longitude of Genoa to the latitude of Ancona, and known as the Ligurian and Etruscan Apennines, are composed of recent rocks, and are an example of "very young" fold mountains, where earthquakes are of common occurrence. Small explosive eruptions, the emission of gases, and the prevalence of land-slides owing to the instability of the rock structure make these mountains in places difficult to cross. The inhabitants generally avoid the valleys and live on higher land which is a region of rolling hills covered with forest and pasture.

The Central Apennines are a region of steep picturesque limestone heights dissected by steep-sided gorges. Here is the highest and widest portion of the Apennines, the Gran Sasso d'Italia, rising to over 9,000 feet. It is a poor region, inhabited

Above A view of Venice, the city of canals, taken from the Campanile. (*Ewing Galloway, N.Y.*)

Below The harbour of Genoa, the birth-place of Columbus. (*Ewing Galloway, N.Y.*)

Above Transplanting rice. Valencia, Spain. *(Exclusive News Agency.)*

Below Stripping bark from cork-oak trees. Spain, Portugal, Italy, and the Landes France all produce cork. A tree twenty years old will yield about 11 pounds of bar
(Exclusive News Agency.)

by peasant farmers and shepherds. The region forms a difficult barrier between the Tiber lowlands and the east coast.

The Southern Apennines are more broken and less difficult to cross. The first great Roman Road, the Appian Way, crossed the peninsula in this region from Rome to Taranto by means of the pass of Benevento. In the "toe" of Italy the mountains of Calabra are composed of ancient rocks and granites but the district is very much faulted and particularly liable to earthquakes. Much of the Southern Apennines are covered with forests of beech and chestnut, but in the valleys, olives, oranges and lemons, are grown.

The Apennines are not rich in minerals. In the north near Carrara are marble quarries. This marble, because of its purity, is highly prized for sculptural work.

The Western Lowlands

To the west of the Apennines lies a region of varied relief which includes:—

(*a*) The Italian Riviera.
(*b*) The Arno plains.
(*c*) The Tiber plains.
(*d*) The plains around Naples.

(*a*) THE ITALIAN RIVIERA.—Extending from the French frontier to Spezia is a narrow coastal plain backed by beautiful mountains, a region of holiday resorts known as the Italian Riviera.

(*b*) THE ARNO PLAINS.—South of Spezia the western coastal plains of Italy have for many centuries been unhealthy malarial swamps, unfit for agriculture or settlement. They were the result of extensive deforestation in the mountains, rapid soil erosion and the consequent accumulation of silt at the mouths of the rivers. Modern schemes of development are concerned with the conservation and replanting of forests and the draining of the marshes. Thus large areas of valuable agricultural land will be reclaimed for the production of food for the rapidly increasing population. Except for the unhealthy coastal margins known as the Maremma, the valley of the River Arno is one of the richest agricultural regions of peninsular Italy. It is especially important for olives, Lucca oil being world famous. In addition, vines, cereals and vegetables are grown and the farms are extensively cultivated. The vines are used for the production of Chianti wines and the

wheat straw is the basis of the straw-plaiting industry of Leghorn.

Pisa, near the mouth of the Arno, was the original port, but the mouth of the river has been choked with silt and Leghorn is now the chief port of the plain.

Florence (400,000) is the chief city of the Arno basin. Like the cities of the northern plain it originally developed as a route centre at a point where upland and lowland meet. Florence controls routes:—

(1) Northward across the Apennines via the La Futa pass to Bologna and the northern plains.

Fig. 88. To Show the Relation of Rome, Naples and Florence (*a*) to the Lowland Areas, (*b*) to Natural Routes.

(2) Southward via the valleys of the Upper Arno and Tiber to Rome.

(3) Westward along the Arno plains to the sea.

Florence has important woollen industries based on the supply of wool from the flocks of the Apennines, but it is most famous as an intellectual centre and for the manufacture of "objets d'art." South of the Arno basin are the hills of Tuscany, one of the few districts in Italy with mineral wealth. Lignite is found near Florence, mercury near Mount Amiata, copper and manganese ores near Siena, and iron ore near Terni. At Terni there are steelworks and small engineering industries.

In these hills are many extinct volcanic cones, the craters of which are filled with deep lakes, *e.g.* Lake Bracciano.

(*c*) The Tiber Plain.—The basin of the Tiber is much less productive than the Arno basin. Until recently few crops

were grown and much of the land was only used as winter pasture for the sheep of the Appenines. In the dry summer the region was virtually an unproductive desert. Along the coastal fringe the formerly malarial swamps extend south-eastward to the Pontine marshes. Like the mouth of the Arno, the mouth of the Tiber is silted up, the original port, Ostia, now being some five miles inland. That the coastal area is very scantily peopled is shown by the fact that there are only six villages in over a hundred miles along the coast to the south of Civita Vecchia.

In the centre of this relatively unproductive plain, known as the Campania, is Rome (1,800,000), the capital of modern Italy (Fig. 88) and one of the oldest cities in the world. Rome grew up around seven low hills in the Tiber plain. These hills rose above the flood level, and so were suitable for defence. They were, moreover, healthier than the surrounding plains. Situated centrally in the peninsula and at the original limit of navigation of the Tiber, Rome was the natural focus of routes and from it, by virtue of the Roman system of road-building, the entire peninsula was dominated. Modern Rome is not an industrial nor commercial city, but essentially the political capital. Within Rome is the Vatican City, the centre of the Roman Catholic faith. For this latter reason Rome is not merely the capital of Italy and the Italian Empire, but is the "religious capital" of all Roman Catholic countries.

(*d*) THE PLAIN AROUND NAPLES.—The remaining plain of the western side of the peninsula is that around Naples, above which rises the well-known volcano, Vesuvius. To the north of Naples are the Phlegrean Fields, also a region of active vulcanism. The volcanic soils of the Neapolitan plains are famous for their fertility. Wheat, vines, oranges and olives are cultivated, the fields and orchards even extending up the slopes of Vesuvius itself. In early times it was thought that Vesuvius was extinct, but in A.D. 79 it erupted and the Roman cities of Pompeii and Herculaneum were destroyed. Pompeii was buried under thick layers of volcanic ash and Herculaneum was overwhelmed by streams of hot mud about sixty feet deep. Vesuvius has erupted frequently since, but in spite of the danger of such eruptions and the repeated

destruction of orchards and fields by streams of lava, this region, because of its fertility, is very densely populated (over 1,000 per square mile).

Naples (1,100,000), on a beautiful bay, is the natural outlet of this productive region (Fig. 88). Because of the recent development of hydro-electricity and the abundant supplies of cheap labour, Naples is the chief industrial centre of peninsular Italy. In addition to engineering and shipbuilding, it has a number of industries based on agricultural products, viz. the manufacture of spaghetti and macaroni, wine and olive oil, and the canning and drying of fruit. Because there is no other good natural site for a port between Leghorn and Naples, the latter city has become especially prosperous and ranks as the third city and second port of the country.

The Eastern Plains

For a distance of over 150 miles south of Ancona, the eastern coastal plain of Italy is very narrow and contains few natural harbours. Numerous parallel streams drain the eastern slopes of the Apennines but they contain little water during the summer months. The whole region is relatively backward and undeveloped.

In the " heel " of Italy the lowland widens and agriculture is more important. Apulia is a low limestone plateau with a very porous soil except where clayey soils have accumulated in depressions. As it lies on the lee side of the Apennines the rainfall is less than on the western side of the peninsula. Owing to the uncertainty of the rainfall and the porous nature of the soil, the yields of the crops vary considerably from year to year. This drawback to agriculture is now being overcome by irrigation. More than 100 miles of aqueducts and over 1,000 miles of irrigation canals have been constructed to distribute water from the Apennines. Wheat is extensively cultivated and is of a particularly " hard " type, very suitable for the manufacture of macaroni. The yield per acre (12 bushels) is only half that of the northern plains.

Apulia produces more olives than any other district in the world, but the quality of the oil is not so high as that of the Arno basin. Vines, figs and almonds are also important crops. Because of the uncertain harvests the peasants are generally poor.

Brindisi, a port originally used by the Romans, is to-day the terminus of the overland route from Northern Europe and a port of embarkation for the East.

The Islands

SICILY.—This, the largest island in the Mediterranean, occupies an important position between the eastern basins of that Sea. Structurally, it is a link between the Apennines of Italy and the Atlas Mountains of North Africa. Climatically, too, it is a link between Italy and Africa, for the northern portion of the island has a Mediterranean climate while the south experiences drier conditions typical of North Africa.

On the northern side of the island, facing Italy across the Tyrrhenian Sea, is a narrow coastal plain backed by mountains. It is a region of fertile well-drained soils and has a genial climate. Olives, oranges, lemons and vines are extensively cultivated. This is the richest region of Sicily, both agriculturally and commercially. Palermo is the largest town and has considerable trade with the mainland.

In the north-east,Sicily is separated from Italy by the narrow (2½ miles) Straits of Messina. The straits were formed by faulting and the region is one especially liable to destructive earthquakes, such as that of 1908, when over 200,000 people perished, and Messina was destroyed. Dominating the eastern side of Sicily are the two volcanic masses of Mt. Lauro and Mt. Etna. The latter (10,740 feet) is one of the largest active volcanoes of the world, and is the most southerly of a belt of active volcanoes extending northward through Stromboli and Vesuvius to Elba. Because of the great fertility of the soil the slopes of Etna are cultivated (cf. Vesuvius) up to the spring line at about 2,000 feet. Cereals and vines are grown and there are extensive orchards of orange, lemon, olive and almond trees. This is the most important area in Italy for the production of citrus fruits.

In sharp contrast to the productiveness of the slopes of Etna is the infertility of the marshy and formerly malarial plain of Catania, which is comparable to the Roman Campania.

The chief town of the east coast is Syracuse (75,000), originally a Greek settlement. In early history when most of Sicily was a Greek colony the east side of the island was the

most prosperous, but its importance has declined, while that of the north coast facing Italy has increased.

The south part of Sicily is a region of new rocks and unstable conditions and is similar to the Northern Apennines. Streams have cut deep gorges, landslides are frequent and communications are consequently difficult.

Though fruits and cereals are cultivated in the more favoured areas, the general infertility of the soil and the low rainfall make this one of the poorest regions of Sicily. The small coastal towns are mainly engaged on the export of sulphur, of which Italy produces about 13 per cent. of the world's supply. Until the discovery of the rich sulphur deposits of Louisiana, which produce nearly 80 per cent. of the world's output, Italy was the leading country for the production of sulphur. Oil fields on the south-west coast are producing two million tons a year and output is still increasing.

At one time Sicily cultivated considerable quantities of cotton and sugar cane but these crops have been unable to survive American competition.

An island of mountains, volcanoes, earthquakes, malarial swamps, and frequent drought, Sicily is, on the whole, one of the poorest parts of Italy, and it is overpopulated in relation to the present development of its resources.

SARDINIA.—Approximately the same size as Sicily, Sardinia has only about one-fifth of its population. It differs from the rest of Italy in that it is not part of the Alpine system, but is composed of blocks of ancient rocks similar to those of Corsica. Highest on the east side and sloping more gently to the west, Sardinia, as it were, turns its back on Italy.

Nine-tenths of Sardinia is mountainous and the plains, like those of Sicily, were formerly infested with malaria, barren in summer and used as pasture in the winter. Throughout the island agricultural methods are primitive. The mountains are known to be highly mineralised, but except for small quantities of zinc and lead few minerals are worked. The forests and fisheries have not been exploited. In recent years a beginning has been made in the draining and reclamation of the marshes, the irrigation of areas liable to drought,

and the generation of electricity. For this purpose a great reservoir has been constructed on the Terso River in the south-east of the island. The chief port of Sardinia is Cagliare on the south-west.

The Trade of Italy

In view of the phenomenal increase in manufacturing industries, especially in Northern Italy, and the shortage of coal, minerals and raw materials, it is not surprising to find that the leading imports are cotton, ores, wool, mineral oil, coal and timber. In addition, foodstuffs are imported to supplement home supplies. These include cereals and fish as well as tropical produce (*e.g.* sugar, coffee, tea, etc.) which cannot be grown in Italy.

The most important exports are:—

(1) Machinery and equipment.

(2) Cotton, rayon and other textile manufactures.

(3) Goods derived from agriculture such as wine, olive oil, cheese, fruit essences and citrus fruits.

(4) Chemicals.

Italy's imports come mainly from Germany, the United States, the United Kingdom and France, and her best customers are Germany, the United Kingdom, the United States, Switzerland and France. Italy normally imports more than she exports, the balance being kept by such "invisible" exports as the earnings of her merchant fleet and of her tourist industry, and the remittances home from Italians who have emigrated.

CHAPTER XIX

THE MEDITERRANEAN LANDS: (3) SPAIN AND PORTUGAL

Decline in Importance

The Iberian peninsula comprises two political divisions, viz. Spain and Portugal, with populations of 30 millions and 9 millions respectively.

In the sixteenth and seventeenth centuries Spain and Portugal were two of the most powerful states in Europe and were famous for their explorations, conquests and trade. To-day they rank as second-rate powers and while they both have a number of colonial areas in Africa they have lost their vast American possessions. The decrease in importance may be due to a number of causes, viz.:—

(*a*) In olden days Iberia was one of the chief sources of minerals in the known world. To-day these supplies are insignificant in relation to the modern demands of industry. Many of the richest mines are nearly exhausted and the same minerals can be obtained more cheaply elsewhere.

(*b*) While other powers were becoming industrialised, Spain, poor in coal resources, lacked the fuel to establish metallurgical industries. Even the iron deposits of the Cantabrians have rapidly diminished and the annual production is now less than two million tons.

(*c*) Small ships were adequate for the trade of the mediaeval period. The commodities (silk, spices, etc.) were not bulky and the total volume of trade was small compared with that of modern times. Many of the famous harbours of Spain have been silted up and harbour accommodation is, with few exceptions, inadequate for modern shipping.

(*d*) The mountainous character of Spain makes internal communication difficult. In olden days when transport

everywhere was slow, the natural disadvantages of Iberia were not so obvious. The difficulty of building modern roads and railways have been a drawback to the internal development of the country.

(*e*) Agriculturally, Iberia has suffered through the competition of other lands. At one time large quantities of wool and wheat were exported, but these commodities can now be obtained more cheaply from the Americas and Australasia. Spain still ranks first in the world for the production of cork, olive oil (Fig. 89) and oranges, but these commodities are insignificant in world commerce when compared with the immense volume of trade in such articles as wheat, wool, cotton, rubber, sugar, etc.

(*f*) Iberia was once the European terminal of the great world trading routes, but to-day sea traffic converges on north-west Europe. The transatlantic routes to North America lie to the north of Iberia, the routes to South America pass well to the west and few of the large ships using the Suez route call at Iberian ports.

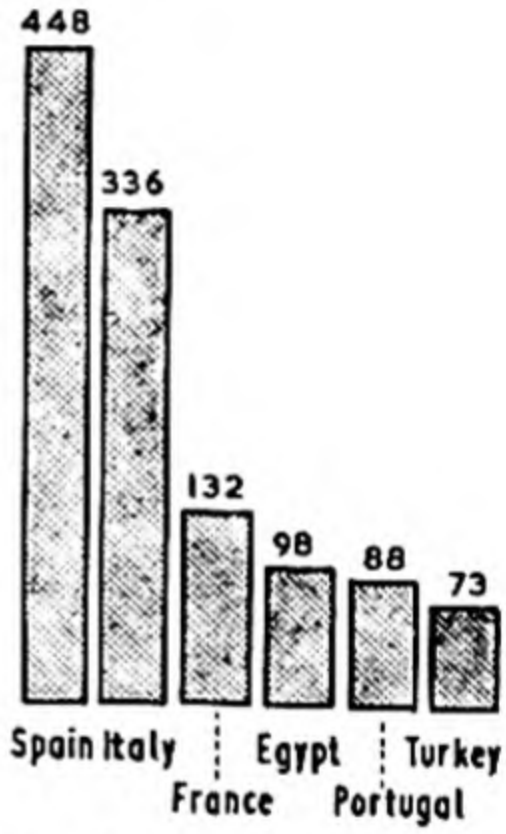


Fig. 89. World Production of Olive Oil in Thousands of Tons (Average 1959-60).

(*g*) In addition, human and social factors may be taken into account. The climate, generally, is not conducive to the maximum output of energy. Natural disadvantages and difficulties have not been faced and surmounted with that zeal and determination which is characteristic of the Dutch and the Danes. Much of the richest agricultural land was acquired by the Church and the aristocracy. The breaking up of large estates into small farms was one of the first aims of the Republican government.

The Relief and Structure of Iberia

Structurally Iberia (Fig. 90) consists of:—

(1) A large plateau known as the Meseta which occupies most of the centre of the peninsula. Like the Central Plateau

of France, it consists of ancient rocks and is part of the Hercynian mountain system of Central Europe. It is drained westward by four parallel streams, viz. Minho, Douro, Tagus, and Guadiana.

(2) To the north of the Meseta are the fold mountain ranges known as the Pyrenees and Cantabrians. These are part of the great Alpine mountain system of Southern Europe.

(3) In the south of Spain is another region of high fold

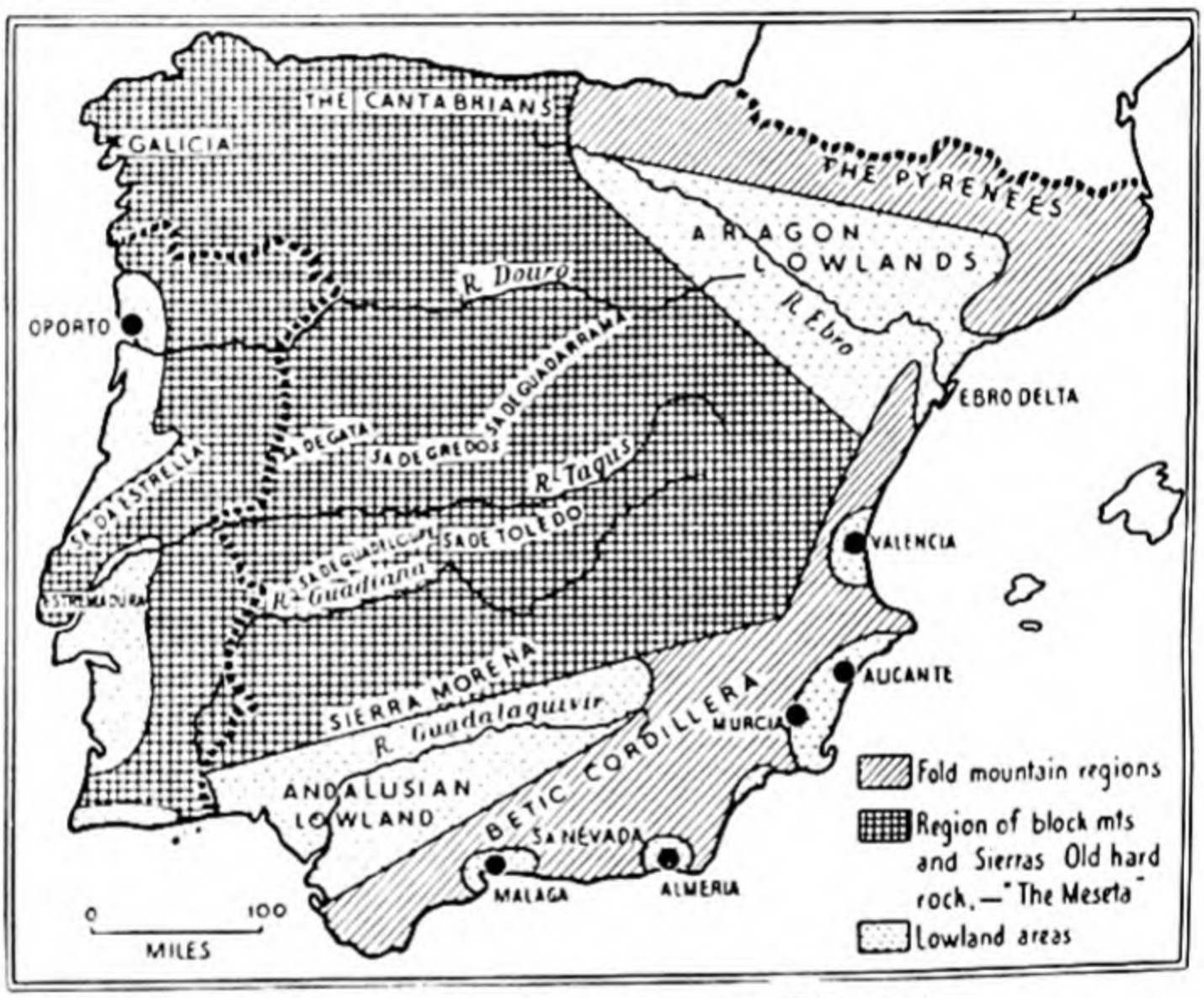


Fig. 90. SPAIN. STRUCTURAL DIVISIONS.

mountains which are also part of the Alpine system. These mountain ranges, which include the Sierra Nevada, extend from Gibraltar to Cape Nao and reappear again in the Balearic Islands.

(4) The lowlands which include:—

(*a*) The lowlands of Portugal lying to the west of the Meseta.

(*b*) The plains of Andalusia, lying between the southern fold mountains and the edge of the Meseta, and drained by the River Guadalquivir.

(*c*) The plains of Aragon, drained by the River Ebro, situated between the northern fold Mts. (the Pyrenees) and the eastern edge of the Meseta.

(*d*) The narrow coastal plains bordering the Mediterranean.

The Climate of Iberia

Though Iberia is classified as a Mediterranean country there are parts of it, as in Italy, where the climatic conditions do not conform to the Mediterranean type.

It is possible to distinguish three major climatic provinces (Fig. 91):—

(A) The northern mountains and coastal plain bordering the Bay of Biscay, which have a climate of the North-West European type.

(B) The Portuguese lowlands and the Mediterranean coastlands which have a climate of the Mediterranean type.

(C) The remainder of the peninsula, *i.e.* the interior, the climate of which has many continental characteristics. The chief climatic features of these three regions are illustrated by the following figures:—

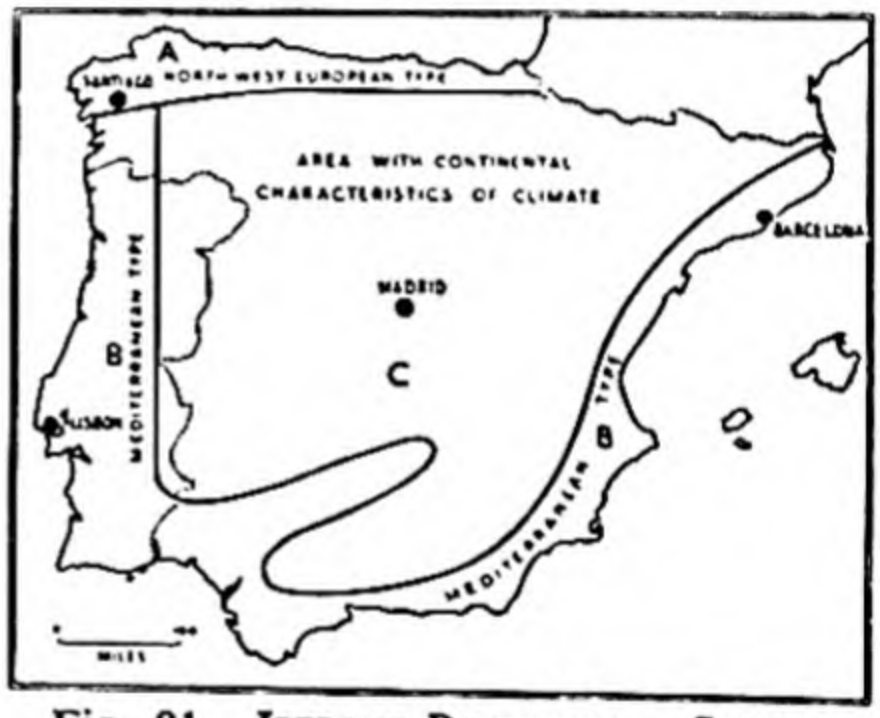


Fig. 91. IBERIAN PENINSULA. SIMPLE CLIMATIC DIVISIONS.

PLACE	TEMPERATURE (F. and *C.*)			RAINFALL		
	July	Jan.	Range	Total	Winter	Summer
(A) Santiago	66° (*19°*)	45° (*7°*)	21° (*12°*)	65″	42″	23″
(B) Lisbon	70° (*21°*)	50° (*10°*)	20° (*11°*)	28″	21″	7″
Barcelona	74° (*23°*)	46° (*8°*)	28° (*15°*)	21″	11″	10″
(C) Madrid*	76° (*24°*)	40° (*4°*)	36° (20°)	17″	9″	8″

* (2,149 ft above sea-level).

(A) Santiago in north-west Spain lies in the track of the westerly winds from the Atlantic all the year round. Therefore its summers are cool, its winters mild, and the annual range of temperature is low (21 F.°, or *12 C.°*). The total rainfall is heavy (65 inches) and the rain falls throughout the year with most during the winter. The driest month (July) has two inches of rain. Except for the slightly higher summer temperatures these climatic conditions correspond very closely to those of Britanny (page 39) or south-west Ireland.

(B) The Mediterranean conditions are illustrated by Lisbon on the west, and Barcelona on the Mediterranean coast. Owing to maritime influence the annual range of temperature is still low but both summer and winter temperatures are higher than those of the northern region. In winter Lisbon is under the influence of the westerlies from the Atlantic and in that season the bulk of the rain (21 inches) falls. During the summer when winds blow from the east, Lisbon is on the lee side of the peninsula and has less rain. Barcelona, on the east coast, farther from the Atlantic influences, has hotter summers and colder winters than Lisbon and the annual range of temperature is 28 F.° (*16 C.°*) as compared with 20 F.° (*11 C.°*) for Lisbon. During the winter, when the westerlies prevail, Barcelona is on the lee side of the peninsula and has less rainfall than Lisbon. While Barcelona has the winter maximum of rainfall typical of Mediterranean regions, a greater percentage of the annual rainfall occurs during the summer months, when easterly winds bring rain from the Mediterranean. The total rainfall of the Mediterranean coastal plains is everywhere much less than that of the Portuguese plains.

(C) The figures for Madrid illustrate the conditions for Central Iberia. Summer temperatures in spite of altitude (2,149 feet) are very high and winter temperatures are low. This is due to distance from the sea and the compact nature of the peninsula. The rainfall is light, as throughout the plateau region. The percentage of the annual rainfall falling in the summer months is higher than in other parts of Iberia. The extremes of temperature and the large proportion of summer rain are due to continental influences (*e.g.* Northern Italy, page 180).

Natural Divisions of Spain and Portugal

From the considerations of relief and climate Iberia can be divided into the following natural divisions:—

SPAIN—

1. The northern mountains.
2. The plateau.
3. The Andalusian plains.
4. The Aragon plains.
5. The Mediterranean borderlands.

PORTUGAL—

6. The Atlantic lowlands.

The Northern Mountains

The northern mountains fall into three groups, viz.: (*a*) the highlands of Galicia in the north-west, (*b*) the Cantabrians, (*c*) the Pyrenees.

(*a*) GALICIA.—Galicia is a region of ancient rocks comparable to those of Brittany and Cornwall. On the north the " grain " of the land is parallel to the coast and there are few good harbours. This, and the whole Biscayan coast of Spain, is an example of the Pacific type of coastline. On the west where the grain of the land is perpendicular to the coast are deep indentations. These drowned valleys are known as " rias " and this section of the coast is an example of the Atlantic type of coastline. The good harbours have helped to foster a love of the sea and the fishing industry is important. Large quantities of sardines are caught and fish canning is a thriving industry. Because of the mild climate and heavy rainfall the mountains are forested, and agriculture is centred in the valleys.

(*b*) THE CANTABRIANS.—The Cantabrians extend from Galicia to the French frontier. These mountains are high (6,000 feet) and are so difficult to cross that only two railways, one from Gijon and the other from Santander, have been constructed to link the coast with the interior. The narrow coastal plain, known as the Rasa, is important for cattle rearing, apple orchards and temperate cereals such as oats,

barley and wheat. The mountains are heavily forested with oak and beech and are an important source of timber and of cork. There is a variety of minerals which include coal, iron, manganese and cobalt in the district around Oviedo, and iron and zinc near Santander and Bilbao. The bulk of the iron-ore is exported to Britain, *e.g.* to Middlesbrough and South Wales, but the supplies are rapidly diminishing. Welsh coal, the return cargo of the ore-carrying steamers, has been used for the establishment of blast furnaces and metallurgical works at Bilbao (280,000).

At their eastern end the Cantabrians are lower and here are the Basque provinces. Because of its relatively low elevation this region is an important highway between France and Madrid. The Basque people are probably descended from the earliest inhabitants of Spain, and in racial type, character, customs and language they are markedly different from the rest of the inhabitants of Iberia.

(*c*) THE PYRENEES.—The Pyrenees, rising to over 11,000 feet, extend from the Bay of Biscay to the Mediterranean and their crest is the frontier between Spain and France. These mountains are of the " Sierra " type with few low passes and consequently form a difficult barrier to cross. For centuries the two main routes between France and Spain lay round the eastern and western ends of the Pyrenees. The Pyrenees are actually more difficult to cross than the Alps because of the narrow gorge-like valleys and the steep-sided cirques at their heads. However, the Pyrenees are tunnelled to provide a railway route between Saragossa and Pau in France. In the east the swift streams are used for the generation of electricity, which is conveyed to Barcelona for use in industry. Large areas on the southern slopes of the Pyrenees are composed of limestone and are used mainly as sheep pastures, but the northern slopes are often heavily forested.

The Spanish Plateau

RELIEF.—The " core " of Spain is a plateau of ancient rocks known as the Meseta, which occupies about five-sixths of Spain. This tableland is tilted from east to west and is similar in structure to the Central Plateau of France. In the east it

rises steeply from the plains of Aragon to a height of over 7,000 feet. From this high eastern edge the Rivers Douro, Tagus and Guadiana flow eastward across the plateau to the lowlands of Portugal. Rapidly flowing, they have eroded deep trench-like valleys, and owing to their swiftness, variations in volume, and the depth of their beds below the general plateau level, they are of little value for navigation. They are in many ways a hindrance rather than a help to transport. Some of the valleys open out here and there into basins which are centres of irrigation and cultivation. In these basins are the principal towns and route centres.

Above the river gorges are gently-sloping stretches of plateau, above which rise high ridges such as:—

(1) The Sierras de Guadarrama, Gredos, Gata and Estrella which separate the basins of the Douro and Tagus.

(2) The Sierras de Toledo and Guadeloupe between the basins of the Tagus and Guadiana.

CLIMATE, VEGETATION AND AGRICULTURE.—The plateau is everywhere a region of extreme temperatures and light rainfall, parts of New Castile in the south-east receiving less than 10 inches of rain annually. Madrid has the greatest seasonal extremes of temperature of any large city in Europe.

Because of the light rainfall there are few trees, except along the river valleys, or on the mountain ridges where the rainfall is heavier. But much of the original forest of the higher regions has been cleared, *e.g.* in the neighbourhood of Madrid. There has been no re-afforestation so that rapid soil erosion has resulted. Much of the Meseta is grassy steppe, but in the drier portions of New Castile the grass gives way to a poor scrub vegetation which often presents the monotonous yellow-brown appearance characteristic of some desert lands (Fig. 92). The tough grass, known as alf-alfa or esparto grass, which will grow in semi-arid regions, is one of the most important products of the plateau. The percentage of cultivated land is low. The most productive areas are in Old Castile and Leon where the rainfall is less scanty and more dependable. Here the region around Valladolid is the chief granary of Spain where wheat and barley are extensively grown. These cereals are for the most part grown by dry-farming methods, *i.e.* the fields are allowed to lie fallow

periodically in order to permit the accumulation of ground water sufficient for the needs of the crops. The yields of wheat are not high (8 cwt per acre) and the total crop is insufficient for the requirements of the country, so that some wheat must be imported.

Vines are cultivated in the Douro valley and on the hill slopes of New Castile. Olives are grown on the hill slopes of the west of the plateau around the Tagus valley. There are a

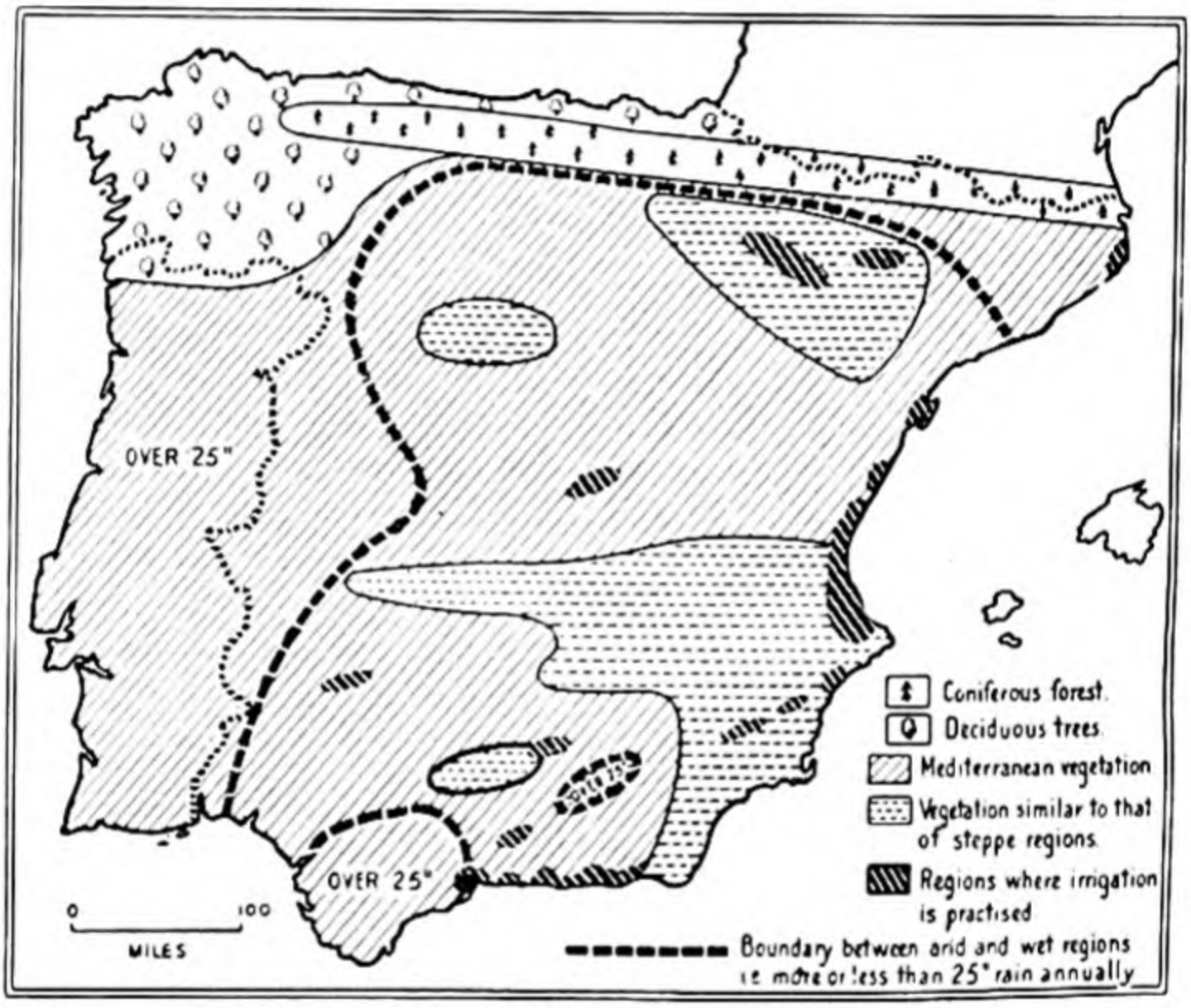


Fig. 92. IBERIA. NATURAL VEGETATION REGIONS

few small irrigated areas, viz. around Aranjuez and Toledo in the Tagus valley, and around the Guadiana in Estremadura.

SHEEP REARING.—The most widespread occupation of the plateau is sheep rearing. Spain has always been famous for the wool of its merino sheep, introduced from Africa by the Moors, but the trade in wool has suffered because of the competition of Australia and Argentina. During the dry summer when the scorched pastures provide insufficient grass, sheep are moved to the mountains, *i.e.* to the Cantabrians in the north and the Sierra Nevada in the south. Until a century

ago the sheep farmers were so powerful that they were able to insist on the maintenance of sheep routes between the plateau and the mountains. This made the tilling of the land impossible over large areas and prevented agricultural progress. To-day the sheep are often transported to the mountains by rail.

MINERALS.—The southern edge of the plateau, known as the Sierra Morena, is one of the richest mineralised zones of Iberia. Coal is mined near Belmez, lead near Linares, mercury at Almaden, and copper and tin at Rio Tinto and Tharsis. Coal production is about 13 million tons a year. Spain provides about 40 per cent. of the world's output of mercury, 20 per cent. of the world's potash, and about 5 per cent. of the world's tungsten, besides appreciable quantities of zinc, copper, and manganese.

TOWNS.—Because of its unpleasant climate, scanty resources and backward agriculture, the Spanish Meseta is one of the most sparsely-populated areas in Europe. Over much of it the population density is less than 25 per square mile.

But in spite of their relative poverty the Castiles have dominated Spain throughout history, and the capital cities of the country have always been situated in the heart of the plateau. Aranjuez, Toledo, Valladolid, Leon and Burgos have all been capitals in turn.

Madrid (2,000,000), the present capital, is almost the geometrical centre of the country (Fig. 93). Situated in a dry and unproductive region on a small tributary of the Tagus, it has few of the normal advantages of a capital city. Railways have been built to link it with the towns of the coastal areas so that it has acquired an artificial nodality. Only one other town on the Meseta has more than 100,000 inhabitants, and its population of two million is largely due to its function as a capital city.

Valladolid (150,000), the great market centre of the Douro valley, ranks next, and is comparable in size to Huddersfield or Birkenhead.

The Plains of Andalusia

The plains of Andalusia lie between the Sierra Nevada and the steep southern edge of the Sierra Morena. They extend inland for over 150 miles to Cordova, and are well watered

because they are open to the Atlantic. The soil, mainly alluvial, is very fertile, particularly between Seville (400,000) and Cordova. Large crops of oranges and olives are grown and the vines of Jerez are used for the manufacture of sherry. There are large stretches of rich pasture land which are used for rearing the bulls for bull fighting.

The coastal belt, known as Las Marismas, is a swampy region similar to the plains of the lower Tiber in Italy.

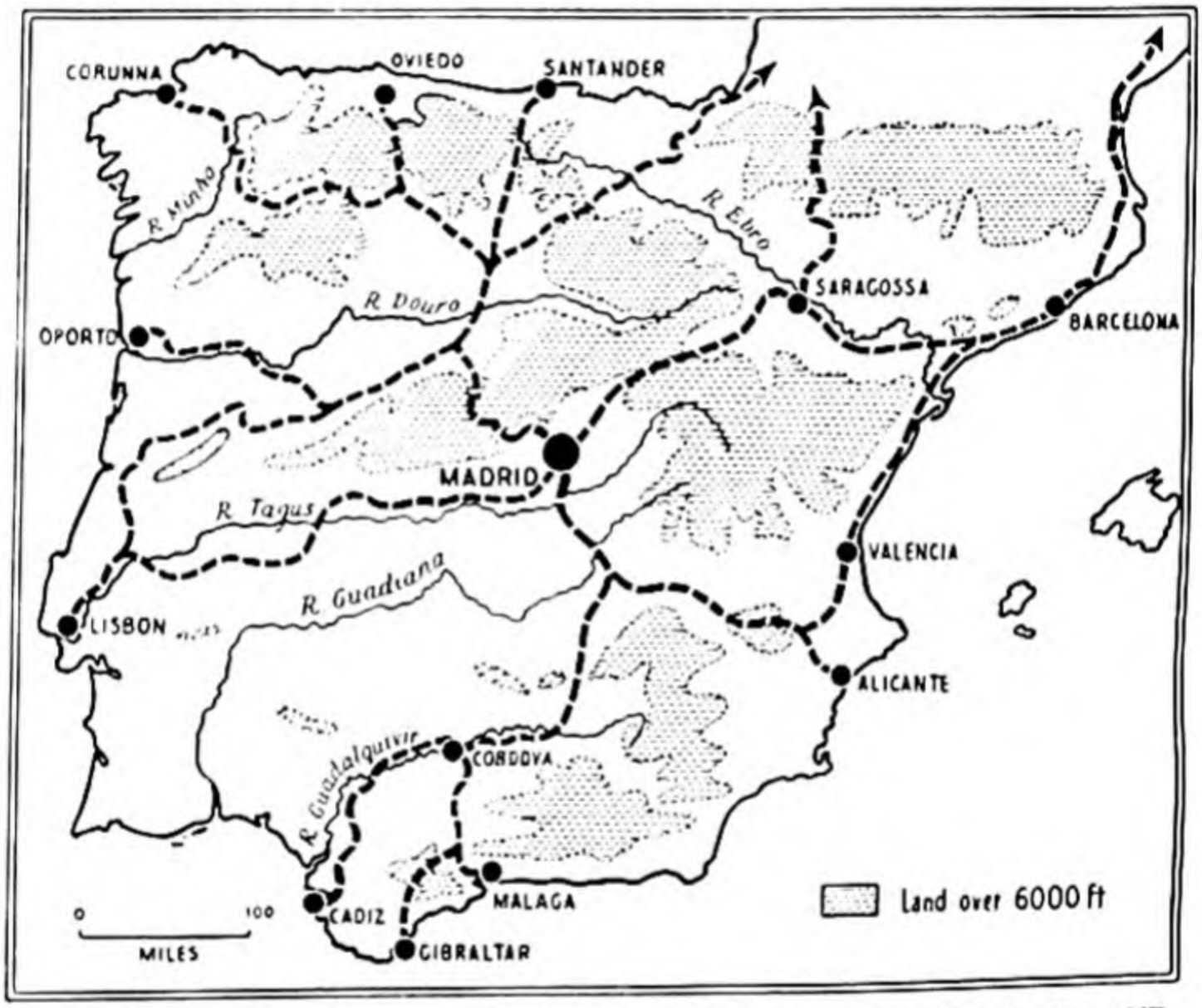


Fig. 93. IBERIA. THE CHIEF ROUTES IN RELATION TO HIGHLAND AND RIVER VALLEYS.—Note the way in which Madrid is linked with the important coastal towns.

Ports such as Palos and Cadiz (100,000) are much less important than formerly because of the silting of their harbours. Huelva is the port through which the minerals of Rio Tinto and Tharsis are exported. Seville and Cordova are the two most important cities of the plain. They were strongholds of the Moors during the Moorish invasions of Spain and contain beautiful examples of Moorish architecture, *e.g.* the Alcazar of Seville.

The Plains of Aragon

The plains of Aragon, drained by the River Ebro, lie between the Pyrenees and the Meseta. Sheltered on all sides by mountains from rain-bearing winds the rainfall is scanty (10 to 12 inches), and though some of the land is irrigated, much more could be done to increase the productiveness of Aragon.

In the upper part of the basin are fields and vineyards, but south-east of Saragossa (300,000) vast areas are only fit for sheep pasture. The valley is as scantily populated as the Meseta, and there is only one important town in the basin, viz. Saragossa, the cross roads of routes from France to Madrid and from Bilbao to Barcelona.

The Mediterranean Borderlands

This section of Spain includes:—

(*a*) The highlands of Granada and Murcia.

(*b*) A number of small coastal plains between Gibraltar and the mouth of the River Ebro.

(*c*) Catalonia.

(*a*) HIGHLANDS OF GRANADA AND MURCIA.—The Highlands extend from Gibraltar to Cape Nao and are part of the fold mountain system of Southern Europe. In many places the mountains rise steeply from the coast and reach their greatest elevation in Mulhacen (11,421 feet). Between the mountain ranges are fertile valleys which are irrigated by the waters of the mountain streams. These high oases are known as *vegas* and the original irrigation works were constructed by the Moors. Wheat, vines and other fruits are cultivated.

Granada (150,000), once a Moorish stronghold, is situated in one of these high valleys of the Sierra Nevada. Like Cordova and Seville it is famous for its Moorish buildings, *e.g.* the Alhambra.

(*b*) COASTAL PLAINS.—Along the Mediterranean coast are a number of small and extremely productive plains each having at least one large town, *e.g.* Malaga, Almeria, Murcia, Alicante and Valencia (500,000). These rich alluvial plains are really the deltas of the swift-flowing streams from the Sierra Nevada. Situated on the side of Spain away from the

rain-bearing winds from the Atlantic these plains have a low rainfall but nearly all have been carefully irrigated. These lowlands are known as *huertas* (Lat. hortus—a garden). They are the richest, most intensively cultivated and most densely populated areas in Spain. Because of the high temperatures in summer and the mildness of the winters an amazing variety of crops can be grown throughout the year. Rice and even sugar-cane, cotton and bananas can be grown on the irrigated land. The date palm thrives at Elche near Alicante, the only locality in Europe where it can be grown. Olives, figs, vines, oranges, lemons, pomegranates, almonds, and a variety of stone fruits are grown. Maize and wheat are both important cereal crops. Valencia is especially noted for almonds and raisins, Almeria for table grapes and oranges, and Malaga for oranges also. It is these fertile plains which make Spain the greatest exporter of oranges in the world in spite of the competition of California, Brazil and South Africa. The Valencian plains have a population of over 1,000 per square mile, a striking contrast to the Meseta.

(*c*) CATALONIA.—Agriculturally Catalonia is similar to the rest of the Mediterranean coastlands and grows large quantities of wheat, vines, olives, etc. In addition, it is the chief industrial area of Spain. Catalonia lacks coal resources, but to-day relies on the hydro-electricity generated in the Pyrenees. The industries of this area include the manufacture of cotton, woollen and silk goods, engineering, paper making, and the manufacture of leather goods and cork goods. Olive oil and wine are manufactured, Tarragona being an important centre for the latter. Barcelona (1,500,000) is the second largest city in Spain and the premier port. It is the great industrial centre of Catalonia.

The contrast between the backward agricultural peasantry of the interior of Spain and the progressive industrialists of Catalonia is probably accentuated by the position of Catalonia at the extreme eastern end of the peninsula. These differences have caused Catalonia to be a region of political unrest and dissatisfaction. In both 1931 and 1934 attempts were made to establish an autonomous state in Catalonia but without success.

The Balearic Islands, which include Majorca, Minorca and Iviza, are structurally a continuation of the fold ranges of

Southern Spain. The islands are mountainous with picturesque limestone peaks. The products are those typical of Mediterranean lands, viz. oranges, olives, grapes, etc. The chief town is Palma (150,000).

Under-Development and Backwardness in Spain

Compared with the other countries of Western Europe, Spain is backward and undeveloped. The average density of population (147) is considerably less than that of France (214), and only one-third that of the British Isles (440). This is not because Spain lacks resources but because little is done to develop her natural sources of wealth. Agriculture could be improved by scientific methods, the use of fertilisers, the adoption of a rotation system for crops, the extension of irrigation and improved methods of marketing goods.

The War of 1939-45 led to an appreciable increase in industrial development, and new industries started include the manufacture of aluminium goods, rayon, motor lorries and radio sets. The extension of hydro-electricity schemes to provide power would overcome, to some extent, the disadvantage of coal shortage. The tourist industry, especially in the Costa Brava area of the north-east, is rapidly growing and becoming an important "invisible export."

Undoubtedly Spain is faced with a number of difficulties, the chief of which are the difficulty of communication, the low rainfall of large areas and the low cultural level and illiteracy of a large proportion of the peasant population.

Exports consist largely of agricultural products and mineral ores, fruit and fruit products accounting for over two-thirds of the total value. The principal exports are fruit, especially oranges, iron and other ores, cork, wool and esparto grass. The principal imports include food products not grown or insufficiently grown and manufactured goods.

Spanish Colonies

Spanish colonial possessions are:—

(1) Rio de Oro and Adrar in North-West Africa.
(2) Ifni in North-West Africa.
(3) Spanish Guinea.
(4) Fernando Po and Annobon in the Gulf of Guinea.

Canary Isles

For administrative purposes the Canary Islands are considered as part of Spain. The largest island is Teneriffe which contains a high volcanic peak nearly 12,000 feet high. In total area the islands are about the size of Devonshire. They are important as a calling point for ships sailing on the Cape route. Las Palmas is the chief town and it exports wine, early vegetables and fruit (*e.g.* bananas and tomatoes).

PORTUGAL

Portugal lies to the west of the Spanish Meseta. Except for the lowland around Coimbra and Lisbon the country consists of upland regions and is crossed from east to west by well-marked ridges, *e.g.* the Sierra de Estrella and the Sierra de Monchique which are continuations of the ridges of the Meseta. The country is drained by the lower courses of the Douro, Tagus and Guadiana. Since the eastern frontier corresponds roughly to the edge of the Meseta the Spanish sections of these rivers differ from the Portuguese sections. Where the streams leave the deep gorges of the Meseta their courses are interrupted by falls and rapids which limit upstream navigation. In Portugal these rivers are more navigable and flow through wider and more fertile valleys than in Spain. This is one of the reasons for the existence of Portugal as a separate political unit. But Portugal differs from Spain in other ways. Open to the Atlantic, it has more equable temperatures and heavier rainfall than the Spanish plateau. The rich pastures and extensive forests of Portugal contrast sharply with the semi-arid steppe lands of the interior of Iberia. The Portuguese section of Iberia was freed from the Moorish invasions at a much earlier date than Spain, and was able to establish an organised state while the struggle with the Moors still continued in Spain. Finally Portugal, as a result of her contact with the sea, has developed more maritime interests than her compact and "continental" neighbour.

North of the River Douro, Portugal is mountainous but there are extensive forests of cork-oak. About one-tenth of Portugal's cultivated area is devoted to plantations of cork-oak.

Cork is the chief export of Portugal which produces half the world's supply. Here, wolfram, the source of tungsten, is mined. The Douro valley is the great vine-growing district of Portugal. Oporto at the mouth of the river is the natural outlet of the region exporting large quantities of port wine, apples and oranges.

South of the Douro are the plains of Coimbra backed by low plateau and the Sierra de Estrella. The plains yield large crops of wheat, maize, barley, vines and olives, but the highlands are largely forested or used for pasture.

The plains of Lisbon produce similar crops to those of the plains of Coimbra. Further south is the less productive plateau of Alemtejo, the most scantily peopled portion of Portugal.

In the extreme south the province of Algarve is a continuation of the Sierra Morena of Spain.

Lisbon (750,000), situated on the estuary of the Tagus, is the capital and chief port. The Tagus estuary is sheltered on the west by a high ridge. The chief industries (mainly textiles) are centred in Lisbon, and the port handles the bulk of the import and export trade of the country. Lisbon is connected by rail with Oporto and Madrid.

Oporto (275,000), at the mouth of the River Douro, is the chief port for the export of wine and has given its name to "port," as Jerez, in Spain, has to "sherry."

Development and Industries

Although Portugal is much richer than Spain agriculturally it is very similar to Spain in the sluggish development of industrial and commercial activity.

The mountains are known to be rich in minerals with deposits of copper, lead, tin, wolfram (tungsten) and kaolin. Few of the mineral deposits are worked because Portugal has negligible quantities of coal and the development of hydro-electric power is backward. However, the production of tungsten is 2,500 tons a year, one-tenth of the world total.

The chief industry is the manufacture of textiles for which cotton and wool must be imported. The second industry in importance is fishing and the principal sardine canning centre is at Setubal about ten miles south of Lisbon. A characteristic occupation of Portugal is the manufacture of porcelain tiles, an industry inherited from the Moors. These tiles are used

extensively for interior and exterior decorative work. The chief centre is at Sacavem near Lisbon. Porcelain is also made at Coimbra. Because of the lower proportion of unproductive land Portugal is more densely populated than Spain, viz. 264 per square mile as compared with 147 for Spain, but the total population (9·1 million) is less than one-third that of Spain (30·1).

The principal exports of Portugal are cork, sardines, wine ("port") and brandy, fruit, wolfram and olive oil. The chief imports are iron and steel goods, raw cotton, motor vehicles, sugar, coffee and coal.

CHAPTER XX

UNION OF SOVIET SOCIALIST REPUBLICS

Introductory

The last thirty years or so has seen a very remarkable rise in the economic power and political importance of Russia, or the Union of Soviet Socialist Republics, as it is now called, which as a world power is now second only to the United States of America. In 1920 Russian agriculture was primitive and her mining and manufactures but little developed. Since then her agriculture has been modernised and her industrial production increased twenty-fold, despite the devastation of the German invasion. This spectacular rise is reminiscent in some ways of that of Japan in the second half of the nineteenth century, but has been far more rapid and far more ruthless, and is still proceeding. After the Bolshevik revolution of 1917, all land, and all mines and industrial concerns, became nationalised, so that the Government is in effect the sole employer. Because of this it was able to work out the celebrated Five-Year Plans for the development of the country.

These plans have been aimed at securing on the one hand economic self-sufficiency, the production at home of all essential commodities, and on the other, of increasing industrial development up to the level of the most advanced western countries. In this connection it should be noted that although Soviet production is so vast, so also is her population, and production of many basic commodities such as coal, electricity, iron and steel, *per head of population*, is still well below the average for the industrialised countries of Western Europe and even more below that for the U.S.A. The same is true of many consumer goods, so that the present standard of living of the average Russian is still low compared to that in Western Europe, although there has been a considerable improvement recently.

Russia in Europe occupies the whole of the great plain of Eastern Europe. Although including so large a portion of the continent she has always been the least European of all European countries. Since 1945, however, her political system

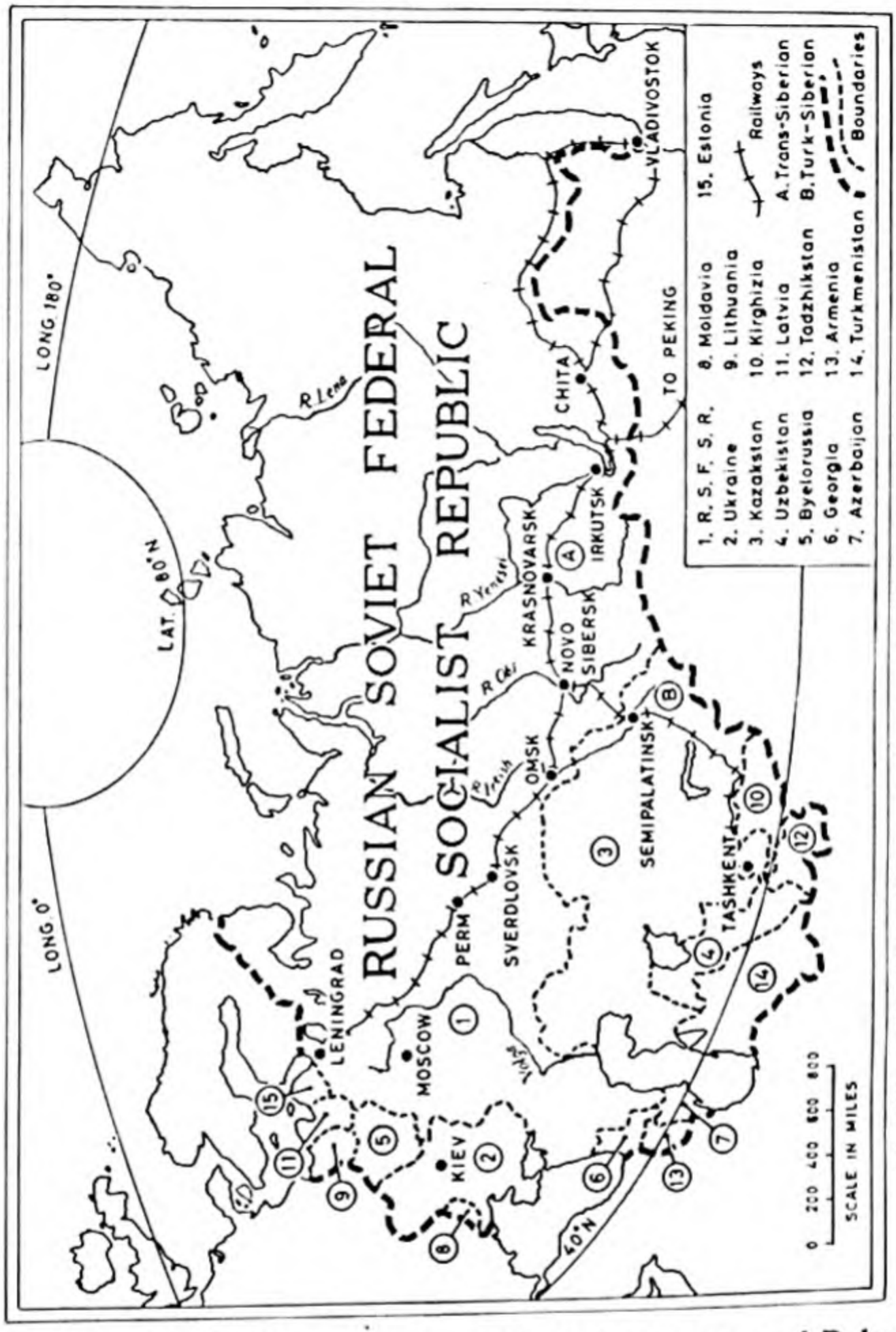


Fig. 94. U.S.S.R. Political Divisions and the Trans-Siberian Railways.

has been adopted by several neighbouring states, and Poland, Roumania, Bulgaria, Hungary, Czechoslovakia and the Eastern Zone of Germany are "Iron Curtain" countries.

But Russia is not confined to Europe. Her adjoining Asiatic territories, separated only by the ineffective barrier of the Urals, extend eastwards to the Pacific Ocean. European Russia and Asiatic Russia were formerly considered as two separate units, though the Asiatic territory was not a Russian

colony, but was rather a vast undeveloped appendage. To-day Russia, from the Baltic Sea to the Pacific Ocean, is *one*, united by the common bond of national and economic development.

Position and Extent

Russia consists of a federation of fifteen republics (Fig. 94), as given in the following list. The number in brackets after the name of each state is the population in millions.

1. The R.S.F.S.R. (119), capital Moscow.
2. The Ukraine (43), capital Kiev.
3. Kazakhstan (10), capital Alma-Ata.
4. Uzbekistan (8·4), capital Tashkent.
5. Byelorussia (White Russia) (8·1), capital Minsk.
6. Georgia (4·1), capital Tbilisi (Tiflis).
7. Azerbaijan (3·8), capital Baku.
8. Moldavia (3·0), capital Khisinev.
9. Lithuania (2·8), capital Vilna.
10. Kirghizia (2·1), capital Frunze.
11. Latvia (2·1), capital Riga.
12. Tadzhikstan (2·0), capital Stalinabad.
13. Armenia (1·8), capital Yerevan.
14. Turkmenistan (1·6), capital Ashkabad.
15. Estonia (1·2), capital Tallin.

The R.S.F.S.R. (Russian Socialist Federal Soviet Republic) comprises all Russian lands not included in 2-15 above and within its limits are fifteen autonomous republics and six autonomous regions.

Russia is the most northerly of the Great Powers. Her capital, Moscow, is about the same latitude as Edinburgh, but about 1,500 miles north of Washington. It must be remembered that the British Isles are in the great "Gulf of Winter Warmth" and have winters some 30 to 40 degrees warmer than the average for their latitude.

The total area of Russia is $8\frac{1}{2}$ million square miles, so that it is more than twice the size of the whole of Europe ($3\frac{1}{2}$ million square miles), more than half the size of all Asia (16 million square miles), ninety times the size of England, and represents one-seventh of the total land surface of the world.

Less than one-tenth of this area is under crops, and about one-fifth is used as pasture. Another two-fifths is forest. Most of the remainder is tundra, mountain or desert. Hence the average density of population is very low, under twenty-five to the square mile (England and Wales, 750). Vast areas are practically uninhabited and the more populous parts are separated by long distances. In fact, distance is one of Russia's biggest economic problems, and to reduce the strain on communications the tendency has been to develop as far as possible a regional self-sufficiency. Russia also claims all land between her northern coast and the North Pole. This claim is made more for strategic than for economic reasons and is of importance in connection with the development of polar air routes. The U.S.S.R. is believed to have an air base in Franz Josef Land, less than 1,500 miles from the American base at Thule in north-west Greenland.

At its greatest width in the north, Russia extends through 170° of longitude, *i.e.* nearly halfway round the world at the Arctic Circle, a distance of almost 6,000 miles (approximately as far as from Liverpool to Buenos Aires). The mainland extends north to latitude 77° N., at Cape Chelyuskin, and south to latitude 55° N., on the borders of Afghanistan, *i.e.* nearly 3,000 miles (cf. Liverpool to New York).

Russia is bounded on the north by the Arctic Ocean, and on the east by the Pacific Ocean. In the extreme east its southern boundary is the River Amur. From the River Amur, westwards to the Caspian Sea, the southern frontiers consist of the high mountains of Central Asia. Farther west the southern boundary follows the south of the Caspian Sea, the mountains of the Turko-Armenian border and the Black Sea. On the west, Russia is bounded by Roumania, Poland and Finland and controls the south-eastern shores of the Baltic from the head of the Gulf of Finland to Kaliningrad. Throughout the whole length of her coastline Russia is handicapped by scarcity of ice-free ports. Murmansk on the Kola peninsula was the only port available prior to the inclusion of Petsamo within the Soviet zone. The warming influence of the North Atlantic drift keeps these ports open at all seasons. The population of Murmansk increased twelve-fold between 1926 and 1939 and is now 226,000.

The lack of easy outlets to the rest of the world is one of the great disadvantages of the position of Russia. The Arctic shores are frozen for nine months, and the Pacific shores are not only frozen during the winter months but as yet are linked with the interior by only one railway line. On the south the mountains, plateau, deserts and semi-deserts of Central Asia form an almost impassable barrier. The Caspian Sea is an inland sea. The Black Sea and the Baltic Sea are almost enclosed and their narrow exits controlled by other powers. Russia's desire for an ice-free Pacific port (Dairen, in the south of Manchukuo) was one of the major causes of the Russo-Japanese war in 1905. The Pacific port of Vladivostok is kept open all the year round by ice-breakers, and in Port Arthur, Russia had for a short time a first-class ice-free naval base on lease from China.

In recent years Russia has pioneered and developed the northern sea route between Murmansk and the Atlantic on the one hand, and the open Pacific on the other, probably for strategic reasons. The route is closed by ice nine months of the year but is used during the short open period from mid-July for the export of timber and for coast-wise traffic with her Arctic ports, such as Igarka on the Yenesei, and various outposts.

People

At the 1959 Census the population of the U.S.S.R. was just over 209 million and was increasing at the rate of over three million a year. More than half of those in employment are office or factory workers. The very severe Russian losses in the 1941-5 war with Germany is shown by the fact that there are even now only 45 men to every 55 women. Just under half the population lives in the towns. The average density of population is very low, under twenty-five per square mile, but the population is very unevenly scattered. Thus vast areas of Eastern Siberia are almost uninhabited and only along the Trans-Siberian railway does the density rise as high as fifty. For European Russia as a whole the density is sixty-five to the square mile, increasing to about 250 in the black-earth region. These figures may be compared with those for, *e.g.* Spain (147), France (214), England and Wales (790) and Holland (833).

The U.S.S.R. contains many different races and peoples but by far the most important are the East Slavs (Russians, Ukrainians and Byelorussians) who constitute more than 75 per cent. of the total, occupy most of European Russia, and have spread in a narrow strip along the Trans-Siberian railway all the way to Vladivostok. There are various Baltic peoples in the north-west (Finns, Letts, Estonians and Lithuanians) representing about 2 per cent. of the total, and the remaining peoples are mostly of Asiatic origin—Mongolian or Turkic.

The East Slavs are a branch of the alpine race (see page 34), their original home was apparently on the north-eastern side of the Carpathians. The Russian alphabet is derived from the Greek and their form of Christianity is that of the Greek Orthodox Church. The Slav peoples of Russia are therefore European in origin and culture but two centuries of subjection to Mongolian invaders, together with a certain amount of admixture with other Asiatic peoples, have left a mark and, this, together with their isolation from the main stream of European development because of vast distances and poor communications, has resulted in their becoming the most Asiatic of the European peoples.

Physical Features: Plains and Lowlands

It may generally be said that the mountains and plateaux of Russia are peripheral (Fig. 95). Within the encircling mountains lies an immense plain which stretches from the western boundary to the River Yenesei. This plain, one of the most extensive in the world, may be divided into three sections:—

(*a*) The plains of European Russia.

(*b*) The plains of West Siberia.

(*c*) The lowlands to the east of the Caspian Sea.

(*a*) THE PLAINS OF EUROPEAN RUSSIA.—These plains are almost featureless. The rocks of the plain are either practically horizontal or so gently tilted that the only relief features are broad gently-rising uplands, such as the Valdai Hills, or the depressions of river valleys. The highest point of the plain is the Valdai Hills (1,062 feet) to the north-west of Moscow. From these hills a low platform (about 600 feet) of ancient

rocks trends south-eastward forming a divide between the basins of the Volga and Dnieper. The north and central portions of European Russia were covered with ice during the Glacial Epoch. As in North Germany, there are extensive deposits of morainic soils, and large areas of swamp and peat bogs. The best known of the marshlands are the Pripet marshes of Byelorussia.

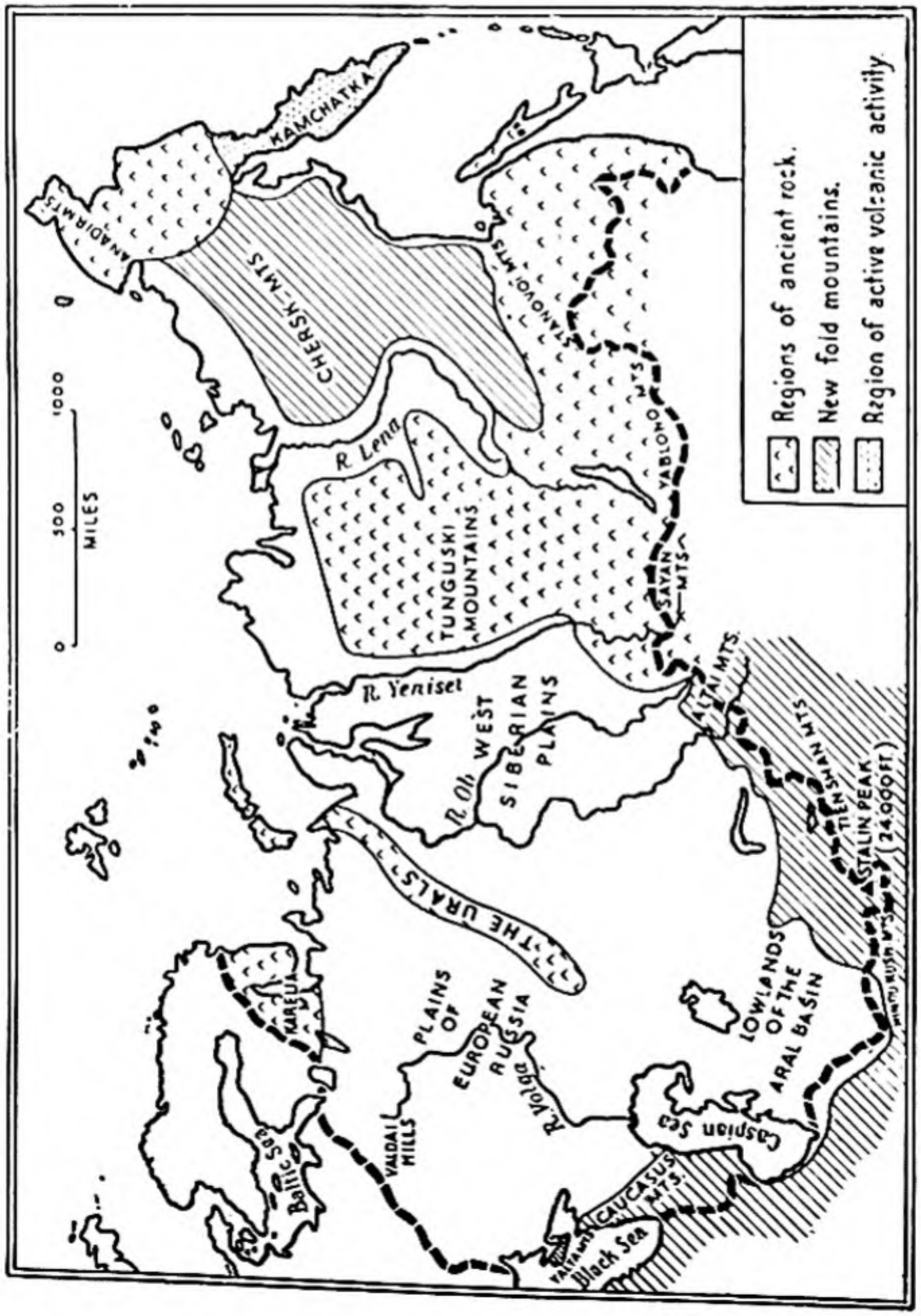


Fig. 95. PHYSICAL DIVISIONS—SHOWING THE PERIPHERAL ARRANGEMENT OF HIGHLAND.

The European plains of Russia are drained by:—

(1) The Dwina flowing to the White Sea.

(2) The Dnieper to the Black Sea.

(3) The Don to the Sea of Azov.

(4) The Volga to the Caspian Sea.

(5) The Niemen and Western Dwina to the Baltic.

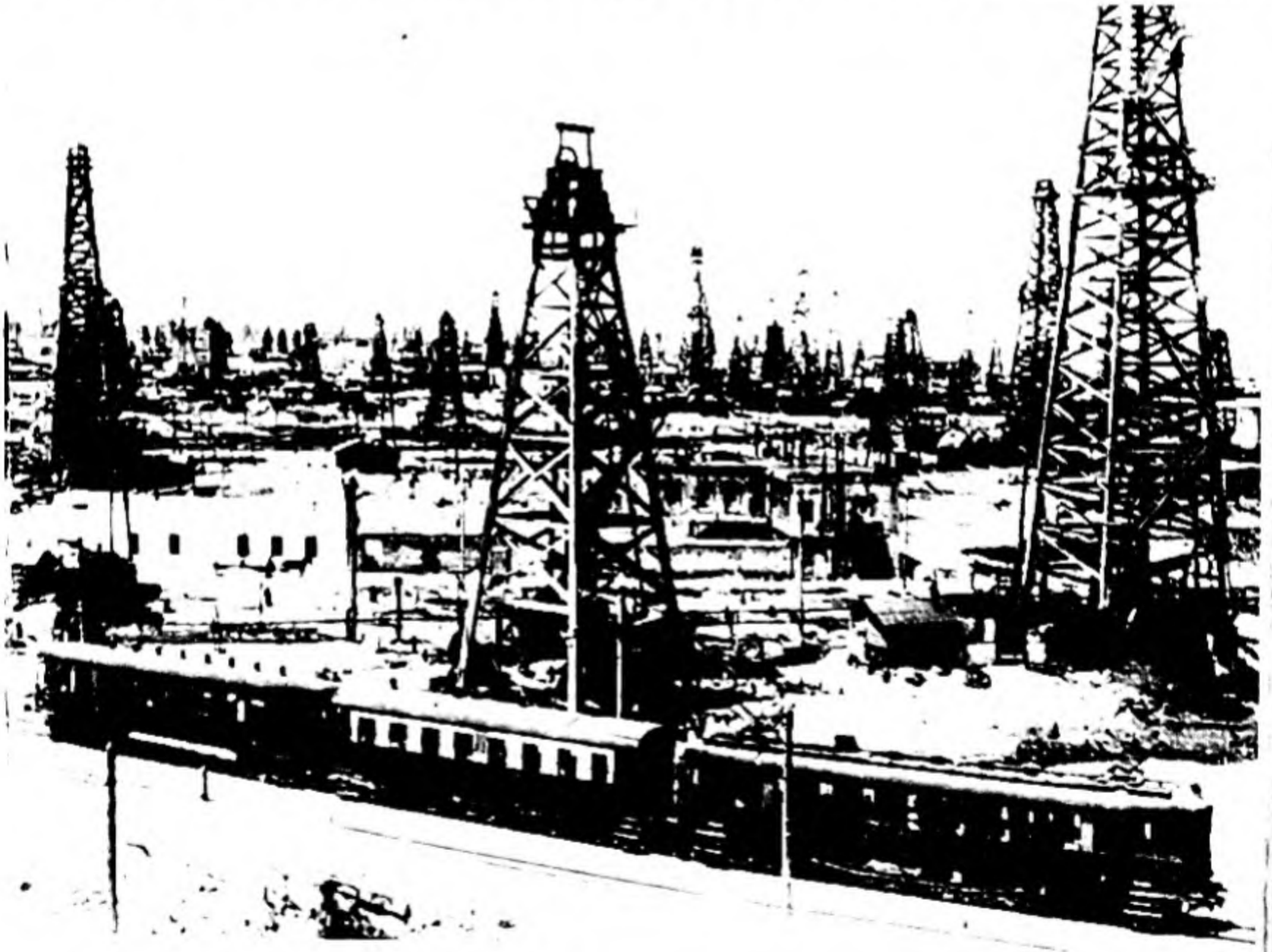
It will be noted that all the rivers, from the point of view of navigation, suffer from the fact that they drain to frozen or inland seas, or to land-locked seas, the exits from which are controlled by other countries.

The Volga rises in the Valdai Hills and within its basin lies the greater part of European Russia. After a course of 2,399 miles it enters the Caspian Sea which is below sea level. Thus a large area of European Russia is a region of inland drainage.

A feature of the rivers of South Russia is the occurrence of sharp elbow bends (see Fig. 106). This is well seen at Stalingrad, where the Volga turns sharply south-eastwards, and at Dniepropetrovsk on the Dnieper.

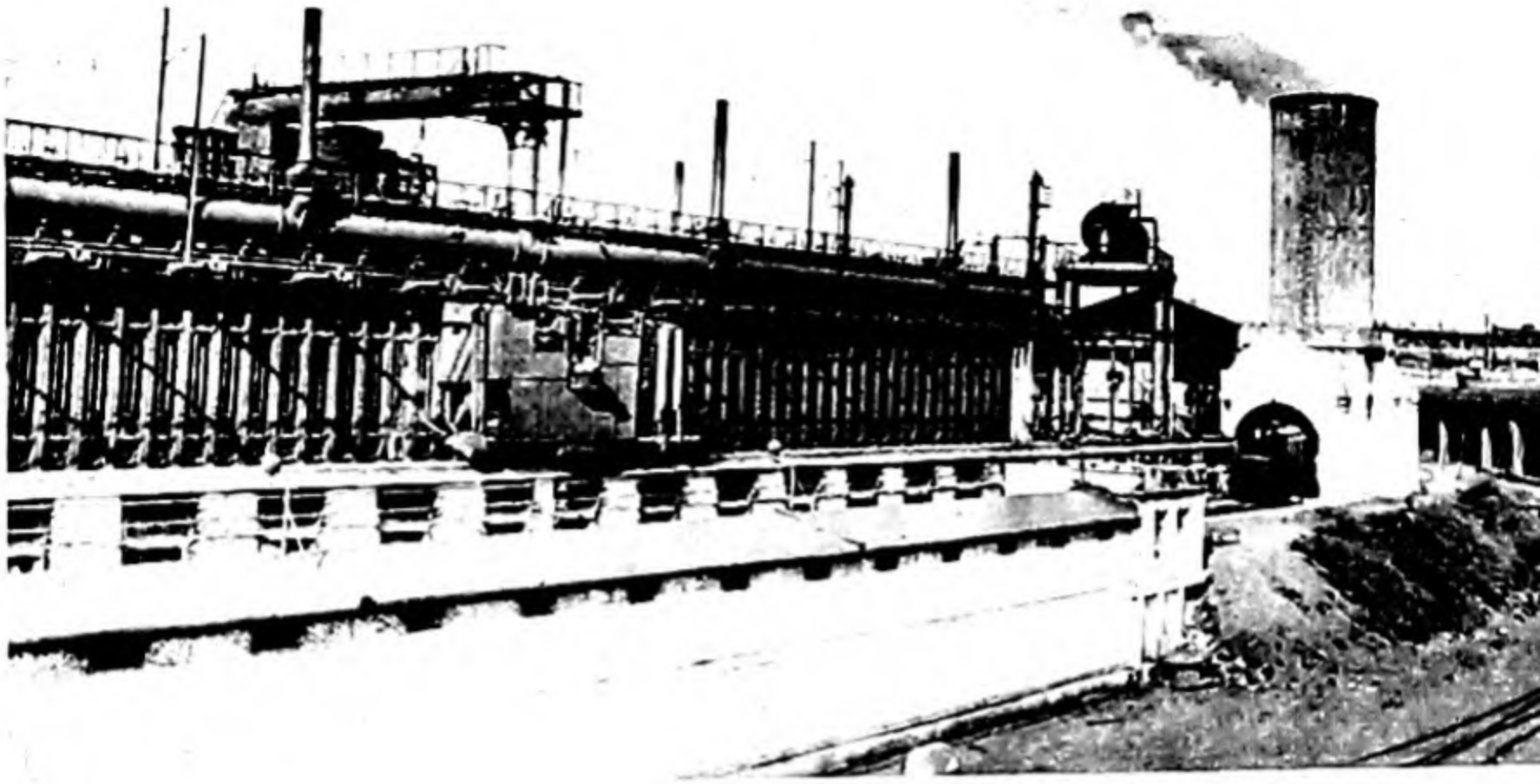
During the winter the Russian rivers are frozen. About April they thaw and receive large quantities of water from the melting of the winter snows. Hence there are extensive floods in early summer which do not subside quickly because of the low gradients and poor drainage. In late summer the water level is low, particularly owing to excessive evaporation and partly because the summer rains are insufficient to maintain a high level. Nevertheless, the rivers of Russia are an important factor in transport. (See page 269.) In winter sledges are used on the ice and in summer the absence of strong currents makes navigation easy.

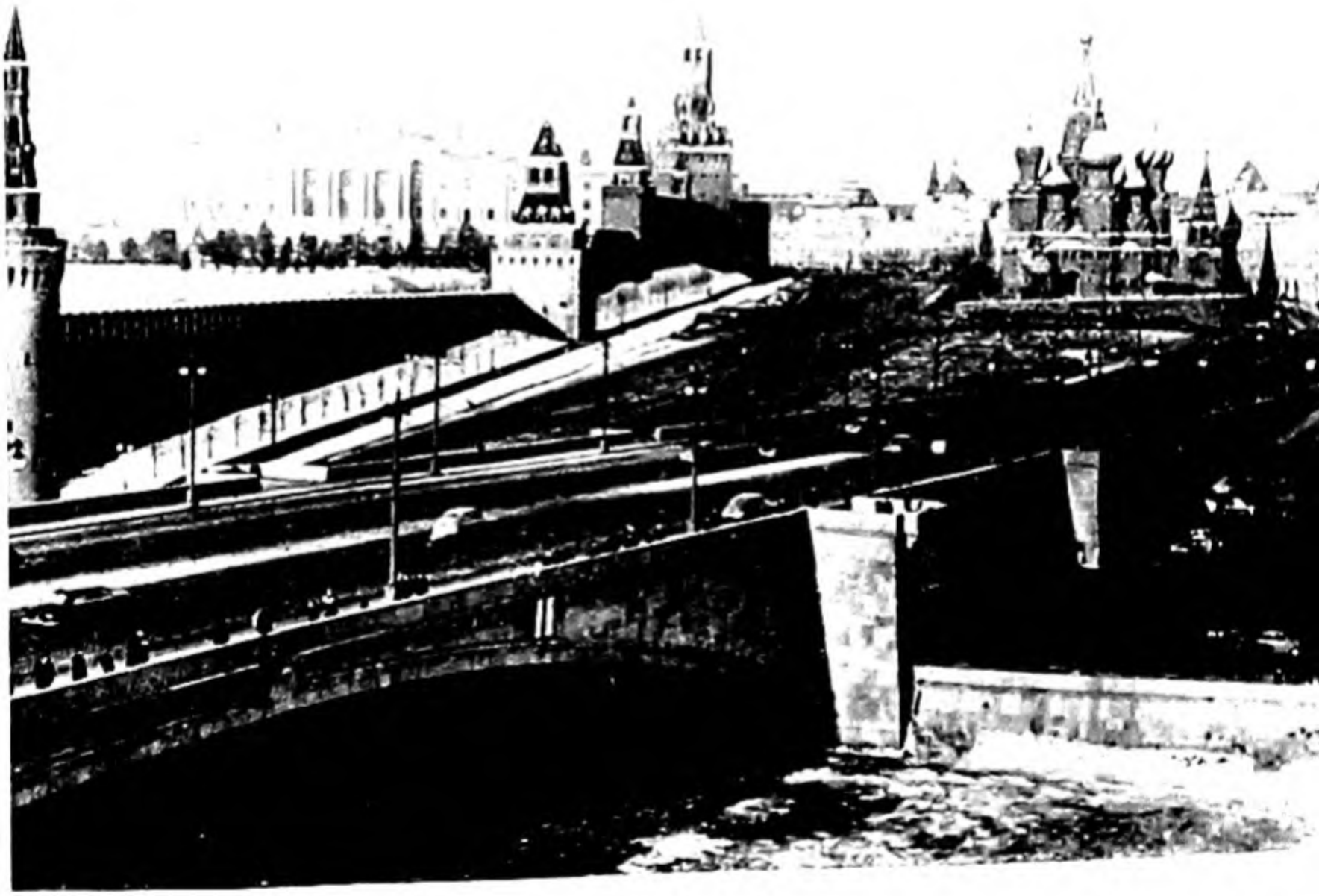
To the east of the plain the Ural Mountains run north to south for a distance of 1,500 miles approximately along 60° E. In the north they rise to over 5,000 feet and are steep on the eastern side. In the south they are lower and broader and slope very gently to the plains so that they are in no way an effective barrier. The railway between Perm and Sverdlovsk (Ekaterinburg) crosses them easily by a pass less than 1,000 feet high. The Urals are not a barrier either politically or climatically, and except in the north-east are not mountainous in character.



Above: The Soviet Union is devoting much care to the improvement of agriculture and the development of new and better varieties of cultivated plants. The illustration shows plantations of two new types of tea plant at the Chakva Research Institute of Tea and Sub-Tropical Plants. (*Planet News Agency.*)

Below: The oilfields at Baku. Note the electrified railway. (*Planet News Agency.*)





Above Coke ovens at the Stalin Iron and Steel Works, Magnetogorsk. (*Planet News Age*

Below Moscow—a view of the Kremlin and the Red Square. In the foreground bridge over the River Moskva. (*Planet News Agency*.)

(*b*) THE PLAINS OF WEST SIBERIA.—To the east of the Urals is the great lowland of Western Siberia, drained by the River Ob. It differs from the plain of European Russia in that it is more uniformly flat, no part of it rising to 600 feet. In the central part of the Ob basin, extending from Tobolsk eastward nearly to the River Yenesei, is the vast Kasyugane Swamp. The River Yenesei flows northward along the eastern borders of the West Siberian lowland.

The rivers of Siberia, *i.e.* the Ob, Yenesei and Lena, are all subject to extensive flooding. They rise in the high mountains of Central Asia and flow northwards to the Arctic Ocean. Their lower courses freeze first and floods result. In the spring the upper courses thaw first and floods again occur.

(*c*) LOWLANDS EAST OF THE CASPIAN SEA.—The third division of the Russian lowlands lies south of the Obi basin and to the east of the Caspian Sea. This lowland is an inland drainage region, the centre of which is the Sea of Aral, into which flow the rivers Syr Daria and Amu Daria. In the east is another lake of inland drainage, Lake Balkhash, fed by the River Ili.

Physical Features: Highlands

The highlands of Russia fall into two groups (Fig. 95):—

(*a*) High folded ranges.

(*b*) Low plateaux and ranges of ancient rocks.

(*a*) HIGH FOLDED RANGES.—In the extreme south of the Crimean peninsula are the Yalta Mountains. These are a continuation of the Alpine system of South Europe. Eastward the fold ranges are continued in the high Caucasus Mountains which trend NW. to SE. across the isthmus between the Black and Caspian Seas. The highest peak of the Caucasus Mountains is Mount Elbruz (18,529 feet) a volcanic peak which was thought to be extinct until it erupted unexpectedly during the present century.

Beyond the Caspian Sea the crests of the Asiatic fold mountains lie outside the boundary, but in Tadzhik and Kirghiz are high ridges, offshoots of the Pamirs. Here are the highest peaks of Russia, Stalin Peak (24,590 feet) and Lenin Peak (23,353 feet). From the Pamirs north-eastward to Lake

Baikal are mountainous regions comprising the north-facing slopes and foothills of the Tienshan, Altai and Sayan ranges. To the east of Lake Balkhash, between the Tienshan and Altai mountains is the Dzungarian Gate, one of the few easy routes across the mountains of Central Asia.

(*b*) PLATEAUX OF ANCIENT ROCKS.—In Northern Siberia, to the east of the River Yenesei, lies a region of plateau and old mountain ranges extending to the Bering Straits. Between the Yenesei and Lena rivers is an ancient plateau, the Siberian Shield (Angaraland), comparable in structure to the Canadian Shield. The highest part, the Tunguski Mountains, forms the watershed between the Yenesei and the Lena. Eastward of the River Lena is a region incompletely known, though recent explorations by the Soviet government have shown that the mountains rise to 9,000 feet in the Chersk range. Kamchatka, a large south-trending peninsula, contains many active volcanoes, and is structurally part of the volcanic fringe of the western Pacific.

Climate

In a country as immense as Soviet Russia great variations of climate are to be expected. There is, however, a remarkable uniformity of climate over large areas on account of the uniformity of relief. Three factors dominate the climatic conditions of the country:—

(1) The E.-W. arrangement of the highland along the southern frontiers. While this mountain barrier shuts out warm winds from the south, the Russian plains are exposed to bitterly cold northerly winds.

(2) Its "interior" position, vast areas being remote from the open ocean.

(3) The bordering seas which only slightly affect either temperature or rainfall. For instance:—

(*a*) The Arctic Ocean is frozen for nine months of the year so that while it helps to keep the summers of the northern margins cool, it exerts little moderating influence upon winter conditions.

(*b*) The Pacific shores are not only washed by a cold current, but in winter the winds blow outwards from the land and are bitterly cold. The summer winds blowing in from the sea make the summers cooler.

(*c*) The Caspian Sea is an enclosed sea with little moderating influence.

(*d*) The Black Sea and Baltic Sea are almost enclosed and their influence is not felt far inland. Only in the extreme north-west on the north of the Kola peninsula is sea influence strongly felt, as a result of the westerly winds from the north Atlantic.

Throughout nearly the whole of Russia three climatic characteristics are predominant:—

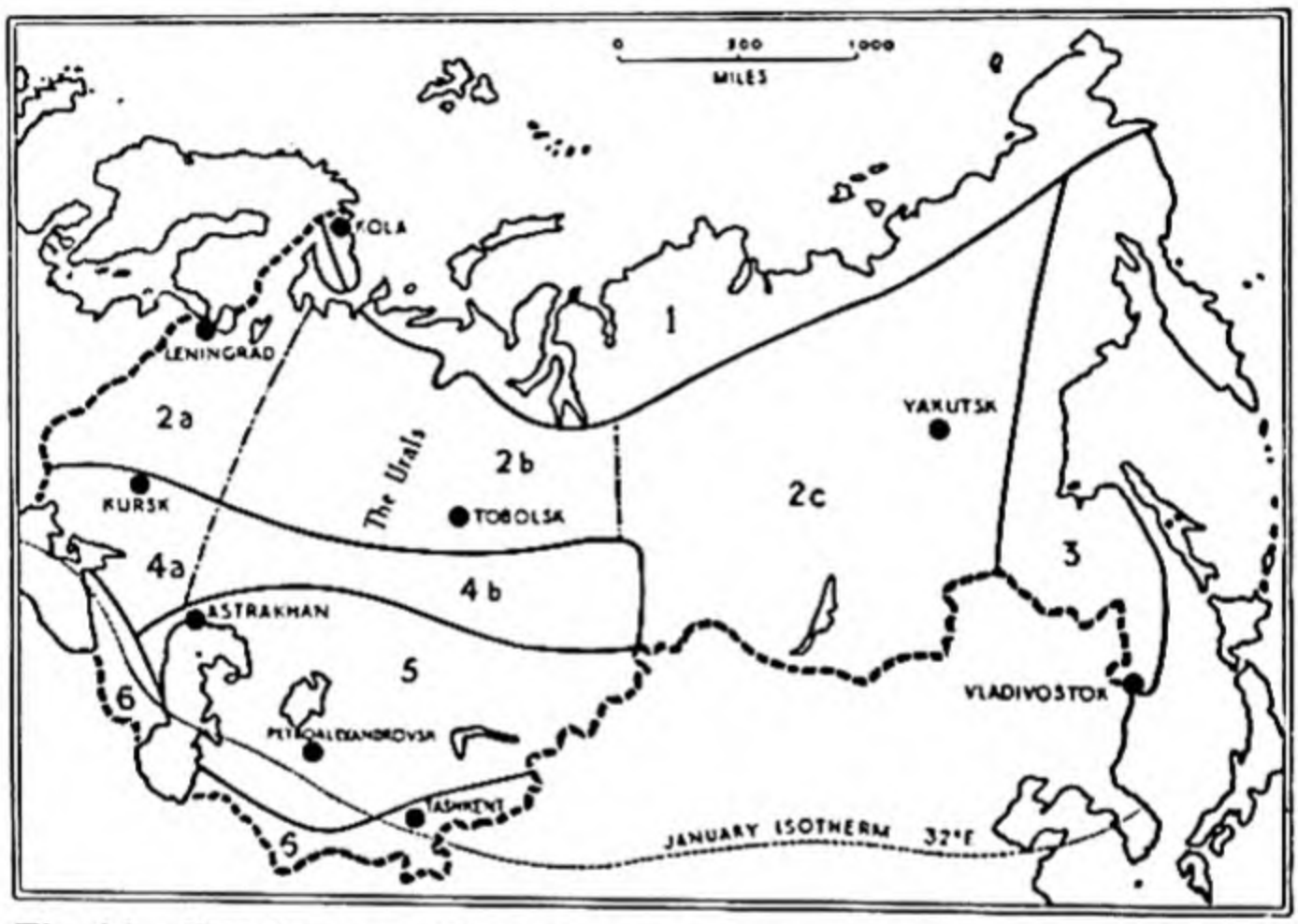


Fig. 96. THE CLIMATIC DIVISIONS OF THE U.S.S.R.—Note carefully the regions which lie outside the 32° F. (*0° C.*) January isotherm, viz. (*a*) the southern Crimea, (*b*) Transcaucasia, (*c*) the southern borders of Central Asiatic Russia in Turkmen, Usbek, Tadzhik, Kirghizia.

(1) Excessively cold winters except in the extreme south. Practically the whole of Russia lies within the January isotherm of 32° F. (*0° C.*) (see Fig. 96).

(2) Large annual ranges of temperature.

(3) A summer maximum of rainfall except on the southern margins.

The Russian lands may be divided into a number of climatic provinces based on latitude, distance from the sea and total annual rainfall. These climatic divisions (as shown in Fig. 96) are:—

(1) The Tundra.
(2) The cool temperate interior lands or Siberian type.
(3) The cool temperate eastern margin or Laurentian type.
(4) The warm temperate interior lands (steppe type).
(5) Interior semi-arid region.
(6) The southern margins.

The climatic statistics for towns within these regions are given in the accompanying table.

Region	Place	Temperature			Rainfall		
		July	Jan.	Range	Total	Sum.	Win.
1	Kola	54° F. *12° C.*	9° F. *−13° C.*	45 F.° *25 C.*°	8″	5″	3″
2 (*a*)	Leningrad	64° F. *18° C.*	15° F. *−9° C.*	49 F.° *27 C.*°	19″	12″	7″
(*b*)	Tobolsk	66° F. *19° C.*	−2° F. *−19° C.*	68 F.° *38 C.*°	18″	13″	5″
(*c*)	Yakutsk	66° F. *19° C.*	−46° F. *−43° C.*	112 F.° *62 C.*°	14″	11″	3″
3	Vladivostok	66° F. *19° C.*	4° F. *−16° C.*	62 F.° *34 C.*°	15″	12″	3″
4 (*a*)	Kursk	67° F. *19° C.*	14° F. *−10° C.*	53 F.° *29 C.*°	18″	12″	6″
(*b*)	Semipalatinsk	72° F. *22° C.*	0° F. *−18° C.*	72 F.° *40 C.*°	7″	5″	2″
5 (*a*)	Astrakhan	78° F. *26° C.*	19° F. *−7° C.*	59 F.° *33 C.*°	6″	2″	4″
(*b*)	Petroalexandrovsk	80° F. *27° C.*	22° F. *−6° C.*	58 F.° *32 C.*°	2″	1″	1″
6 (*a*)	Yalta	76° F. *24° C.*	38° F. *3° C.*	38 F.° *21 C.*°	20″	7″	13″
(*b*)	Tashkent	81° F. *27° C.*	30° F. *−1° C.*	51 F.° *28 C.*°	15″	5″	10″

(1) The Tundra.—This region is bounded on the north by the Arctic Ocean and on the south by the July isotherm of 50° F. (*10° C.*). Although in the example quoted (Kola) the summer temperature is 54° F. (*12° C.*) the mean summer temperature of the tundra is, in general, less than 50° F. (*10° C.*). The winter temperatures vary from 10° F. (*− 12° C.*) in the west to − 40° F. (*− 40°C.*) near the mouth of the River Lena. The rainfall is scanty (less than 10 inches) and falls chiefly in

summer. Winter precipitation is in the form of snow, which does not melt but accumulates in great drifts.

(2) THE COOL TEMPERATE INTERIOR.—The whole of this immense region is characterised by summer temperatures averaging about 65° F. (*19° C.*) and by a well-marked summer maximum of rainfall. Winter temperatures, however, vary considerably according to the distance from the western ocean. It is therefore convenient to subdivide this region into three sections, A, B, and C, illustrated by the conditions of Leningrad, Tobolsk, and Yakutsk. The winter temperature of Leningrad is 15° F. (— *9° C.*). Fa ther east at Tobolsk the January temperature has dropped to — 2° F. (— *19° C.*) and still farther east at Yakutsk to — 46° F. (— *43° C.*). Since the summer temperatures are nearly uniform the range of temperature increases eastward with the increase of winter cold. Verkhoyansk, to the north-east of Yakutsk, has the largest range of temperature in the world (120 F.°) and is also the "cold pole" of the world, with an average January temperature of — 60° F. (— *51° C.*).

In this section of Russia, too, the total annual rainfall and the winter rainfall decrease slowly eastward (for Leningrad has 19 inches as compared with 14 inches at Yakutsk) and the summer maximum of rain becomes more pronounced towards the east.

(3) THE EASTERN MARGINS.—The part of Russia which borders the Pacific has a somewhat lower summer temperature than the interior. It should be noted that while Yakutsk and Vladivostok have similar summer temperatures, the latter is much farther south than the former. The winters, while very cold, are not as intensely cold as those of the interior. Though the Pacific margins are subject to intensely cold west winds from the interior of the continent during the winter months, the sea moderates the winter temperatures slightly. In summer the winds blowing inland both lower the summer temperatures and increase the rainfall. In these eastern margins the summer maximum of rainfall is more strongly marked than elsewhere in the cool temperate belt.

(4) THE WARM TEMPERATE INTERIOR (STEPPE TYPE).—In this region as in the cool temperate belt there are considerable differences between the western and eastern sections. The

change from west to east is, as in the more northerly belt, marked by a decrease in winter temperatures, a corresponding increase in annual range of temperature, and a decrease in the total annual rainfall.

Throughout the region the average summer temperatures are approximately 70° F. (*21° C.*), but between Kursk and Semipalatinsk the winter temperatures drop by 14 F.° (*8 C.°*). Kursk in the west has an annual rainfall of 18 inches, but at Semipalatinsk, farther from the sea, the rainfall drops to 7 inches, most of which is of the convectional type.

(5) INTERIOR SEMI-ARID REGION.—This area includes the northern margins of the Caspian Sea and the lowlands around the Sea of Aral.

Here the summer temperatures are high—80° F. (*27° C.*), the winters cold [but not as low as 0° F. (*−18° C.*)] and the rainfall scanty. Again the rainfall decreases towards the interior and falls as low as 2 inches annually in the valley of the River Syr Daria. Much of this inland drainage area is sandy desert.

(6) THE SOUTHERN MARGINS.—This section of Russia includes:—

(*a*) The south-facing slopes of the extreme south of the Crimea.

(*b*) The Batum to Baku depression south of the Caucasus.

(*c*) The southern mountain borders of Uzbek and Tadzhik.

Here, in great contrast to the remainder of Russia, average January temperatures are generally above 32° F. (*0° C.*) and the greater part of the rainfall occurs during the winter half of the year. This winter maximum of rainfall is due to eastward-moving depressions from the Mediterranean. The climate of the southern Crimea is (except for the slightly colder winters) Mediterranean in type. Batum has the highest rainfall in Russia, viz. 93 inches annually. This is largely relief rainfall due to the mountainous nature of the surrounding country.

The high summer temperatures of Uzbek and Tadzhik (*e.g.* Tashkent) are of special importance (as will be seen later) because of their influence on the type of products that can be cultivated.

Vegetation

The distribution of natural vegetation in Russia is closely connected with the climatic divisions. A comparison of Figs. 96 and 97 will show how far this is true.

(*a*) The Arctic coastland (corresponding to region 1 in the climatic map) is a region of tundra. Here the summers are too cool for the growth of trees. The ground is frozen for most of the year and during the summer the surface soil thaws to a depth of only 2 feet. The natural vegetation of this region consists of mosses and lichens, small berry-bearing bushes (*e.g.* the whortleberry) and stunted birch trees along the watercourses. Well-drained south-facing slopes are often carpeted with flowers during the short summer season.

(*b*) Extending across the cool temperate zone of Russia from the Baltic Sea to the Pacific is a great belt of forest land. This forest zone corresponds to regions 1 and 2 on the climate map. It consists almost entirely of virgin coniferous forests in which pines, fir, spruce and larch are the chief trees. In the south-west in European Russia where the climate is more humid, and warmer in winter than the interior, the original forest (much of which has been cleared) was of the deciduous type. This zone of deciduous forest tapers eastward and disappears near the southern end of the Urals.

In the south-east, also, where proximity to the Pacific moderates the winter temperatures, deciduous as well as coniferous trees are found.

(*c*) South of the forest belt and extending over the western half of Russia is a rich grassland region, comparable in type to the prairies of North America or the pampas of Argentina. This steppe land corresponds to region 4 of the climatic map. The grassland is richest in the Ukraine (south of European Russia).

(*d*) Around the north of the Caspian Sea and in the lowlands drained to the Sea of Aral are extensive areas with deficient rainfall, corresponding to region 5 on the climatic map. These are regions of poor steppe land, often without a continuous covering of grass. In the centre of this area, especially to the south and east of the Sea of Aral, are true deserts, the

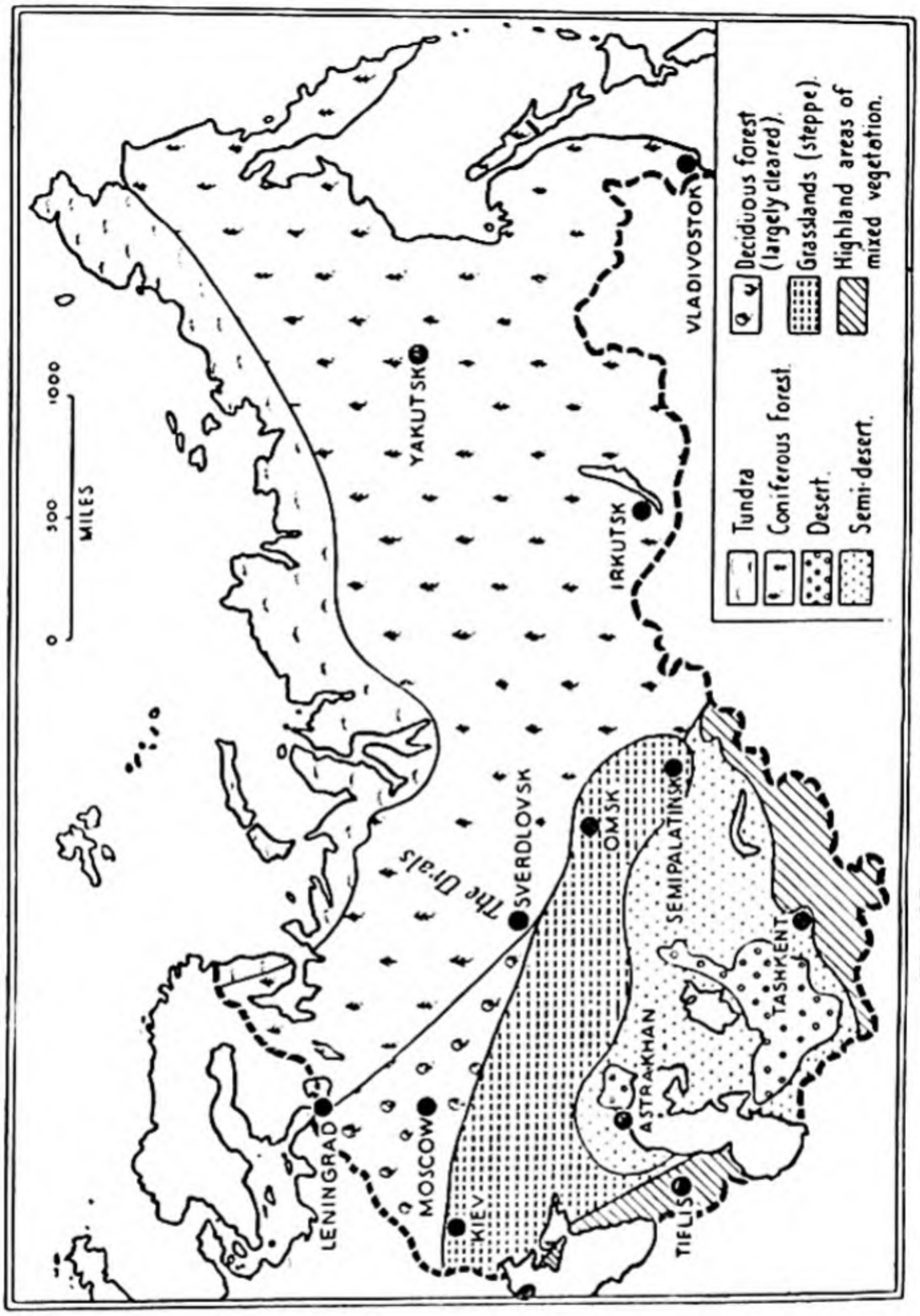


Fig. 97. NATURAL VEGETATION OF THE U.S.S.R.

Kysyl Kum and Kara Kum deserts. These are among the most extensive sandy deserts of the world.

(*e*) The southern extremity of the Crimea has vegetation typical of Mediterranean areas. The mountain slopes of the Transcaucasian region are forested with conifers at the higher, and deciduous trees at the lower, levels. The mountain

slopes of Usbek and Tadzhik are similarly forested except where the mountains are too high to allow tree growth.

The Soils of Russia

The view was formerly held that, especially in the temperate zone, the properties of soils, *i.e.* their colour, depth, fertility, etc., varied in direct relation to the nature of the underlying rock. Investigations have, however, shown that certain soils repeatedly occur throughout the world, where similar conditions of climate and vegetation exist. Scientists have, therefore, come to the conclusion that climatic factors have a far greater influence on the formation of a particular type of soil than was formerly supposed. Evidence in support of this belief is especially strong in a study of the soils of Russia.

There are six belts of soil which run from east to west across the country. The distribution of these soils conforms very closely to the climatic and vegetation regions (compare Figs. 96, 97, 98).

(1) In the north are the poor tundra soils, waterlogged and frozen for the greater part of the year. These soils are infertile, pale grey in colour and contain little humus (decayed vegetable matter).

(2) South of the tundra in the region of coniferous forests, low temperatures and moderate rainfall, the soils are known as podzols,* or "soils of the pine forests." These are slightly less infertile than the tundra soils and are grey in colour. They have been formed slowly because the thick mantle of forest debris protects the underlying rocks from rapid weathering. The podzols are generally acid in type (*i.e.* deficient in lime) and do not contain a high percentage of humus or other plant foods. Such soils when brought under cultivation need liberal application of lime and manure. Since they occur in the cool temperate zone they are principally used for the cultivation of hardy cereals, oats and rye, and for clover.

(3) In the region of the deciduous forests of European Russia the forest debris has decomposed more rapidly and become incorporated with the soils. These soils, especially the upper layers, are darker in colour than the podzols and

* "Podzol" is a word of Russian origin meaning "soil the colour of ashes."

are more fertile and better aerated. As they are characteristically brown, they are usually referred to as "Brownerths."

(4) In the steppe regions are rich dark soils known as "Black Earth" or "chernozem." These soils occur throughout the world in grassland regions where the annual rainfall is about 15-20 inches. This rainfall is insufficient to dissolve and carry away the mineral salts. Hence the Black Earth is extremely fertile, being rich in humus, lime and other plant foods. These soils form some of the richest agricultural land in the world, though a limit is set by the low rainfall to

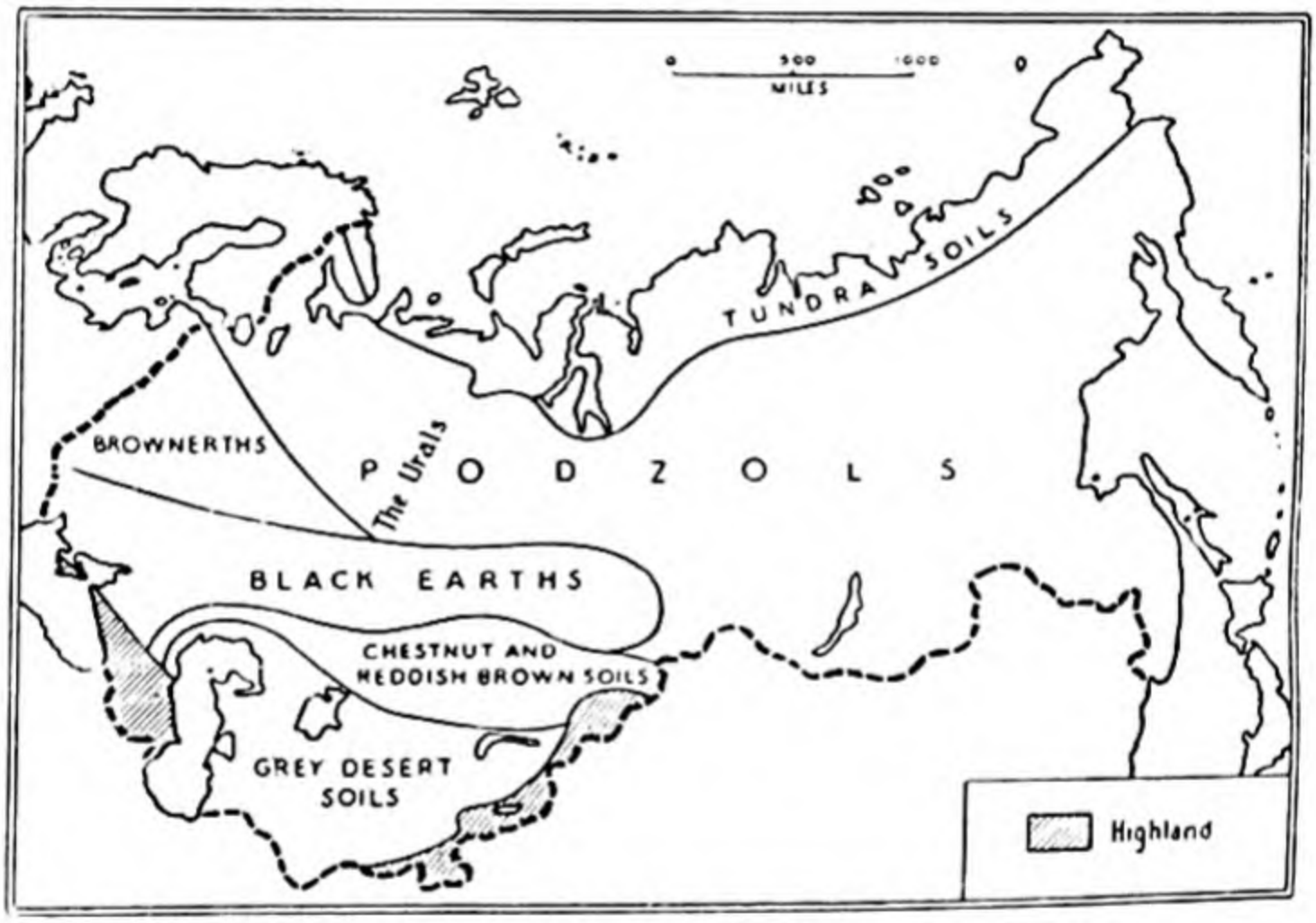


Fig. 98. THE MAJOR SOIL ZONES OF THE U.S.S.R.

the crops that can be cultivated on them. The chief crop of such regions is wheat.

(5) South and east of the steppe land is the semi-arid steppe. Here the Black Earth gives place to reddish brown and chestnut coloured soils.

In this zone the rainfall is less and the grassy covering poorer and less continuous. The soils contain less humus than the Black Earth but are rich in lime and other plant foods. They are used extensively for pastoral occupations, but with irrigation become productive agricultural lands.

(6) Finally in the deserts of the Aral Basin are the grey desert soils. In these regions mechanical weathering is rapid and rocks are quickly disintegrated. But, owing to the low rainfall, chemical weathering is slow and because of the absence of vegetation there is little humus in the soils. Desert winds blow the loose soil from place to place so that new rock surfaces are constantly exposed. The cultivation of desert soils is usually limited to the oases.

CHAPTER XXI

UNION OF SOVIET SOCIALIST REPUBLICS: AGRICULTURE

Agriculture in Russia before the Revolution

Before 1914 agricultural development in Russia was comparable with that of England in the Middle Ages. Although agriculture had reached a more advanced stage in European Russia than in Asiatic Russia, yet the former was far behind the countries of peninsular Europe in development. Methods of cultivation were primitive; yields were low (*e.g.* 6 cwt of wheat per acre); soils became exhausted because of lack of manuring; rotation of crops was almost unknown; and the habit of single crop cultivation made the farmer insecure, because of the fluctuation of prices in the world market.

Before the Revolution, two types of agriculture prevailed in Russia.

(*a*) The cultivation of large estates held by the Russian aristocracy. It was the existence of these huge estates, in spite of low yields, that made possible the export of vast quantities of wheat, flax, hemp and sugar to Western Europe.

(*b*) The cultivation of small fields by the peasants. There were about twenty millions of these, averaging about eleven acres of arable land apiece. These poor peasant holdings were farmed primarily to supply the food requirements of the cultivators and only a small percentage of the produce was sold. Usually rye was cultivated for home consumption, whilst wheat was the "money" crop.

It should be borne in mind that despite Russia's vast area and relatively sparse population she has no large areas waiting for the plough as had the United States in the second half of the nineteenth century. From a purely agricultural point of view, the U.S.S.R. is already over-populated. Like Canada, a large proportion of its area, because of its climate or the nature of its soil, will never be suitable for cultivation. Of Russia's eight million square miles, one million is tundra; four millions are *taiga* or coniferous forest, where the short

growing season, winter cold and poor soil, alike combine to daunt the farmer; and another million is desert. In all, probably less than one-tenth of the total area is possible arable land. The grasslands of the steppes, with their rich soil, offer the greatest possibilities; here the limiting factor is the low and very unreliable rainfall. With the tragic lesson of America's "dust-bowl" of the nineteen-twenties to profit from, Russia is planning to develop these areas by irrigation and the most up-to-date methods of dry farming. Elsewhere crop yields can be still further improved by scientific farming, although for climatic reasons they are never likely to be as good as on similar land in Western Europe.

Agricultural Developments

In 1928, under the schemes of the First Five-Year Plan (1928-33), the agricultural economy was entirely reorganised.

(1) KOLKHOZES.—Peasant farmers were amalgamated into large-scale collective farms (kolkhozes). To these co-operative units the government supplied selected seeds, tractors and up-to-date agricultural machinery. Instruction in scientific agriculture and technical help in the use of machinery was provided. By the late 'thirties individual farmers had practically ceased to exist, and there were a quarter of a million collective farms. These have since been reduced to about 45,000 by amalgamation into larger units, each consisting of some 200 to 300 families and with a sown area of over 5,000 acres. Cultivation and harvesting is now almost entirely mechanised, involving the use of nearly one million tractors and half a million combine harvesters.

(2) SOVKHOZES.—Particularly in the undeveloped agricultural lands where few peasant farmers were already established (*e.g.* the drier south-east of European Russia and the steppe lands of Siberia), but also in other areas as well, some 7,500 large-scale state farms (sovkhozes) have been formed, worked by hired labour, averaging 400 workers per farm. Since the sovkhozes are farmed on the most modern lines they can produce crops more cheaply than the collective farms and the yields per acre are higher. They produce two-fifths of Russia's grain and a quarter of her meat.

(3) RECLAMATION OF MARSHLAND.—Extending from the Polish border eastwards to the River Lena is a broad belt of marshland. Already over 5,000,000 acres of these marshlands have been drained. Special progress has been made in White Russia and in West Siberia The drained lands provide rich meadows for the dairying industry, and are also being cultivated for the production of flax, hemp, wheat and vegetables.

Malarial marshes have been drained in the Kuban valley between the Sea of Azov and the Black Sea, and in Transcaucasia, near Batum. Here reclaimed lands are being used for the cultivation of organges, lemons, rice, tea and tobacco.

(4) IRRIGATION.—The U.S.S.R. has paid much attention to irrigation, and some 27,000 square miles, an area more than half England and Wales, are already irrigated. The irrigated areas are largely steppe and desert lands of Kazakhstan, and of the Tadzhik, Usbek, and Turkmen Republics, where water is obtained from mountain streams fed in summer by melting snow; steppe land north of the Caucasus is supplied from the River Kuban by the Nevinnomyssk canal; there are various smaller areas elsewhere, including about 500 square miles already irrigated from the new Volga-Don canal. Cotton, fruit, wheat and rice, are grown on much of the irrigated land.

There are on hand at present five vast projects, which will lead to the irrigation of some 100,000 square miles of steppe land, stretching from the north Crimea to the River Ural, an area nearly ten times that of the irrigated portion of the Nile Valley. Each of these projects has three aims in view, (i) the production of hydro-electricity for use in agriculture and industry; (ii) irrigation; (iii) the improvement of river navigation. Most of these power stations and river works have already been completed but the irrigation works will take considerably longer. These new schemes are:—

(i) On the Volga at Kuibyshev.

(ii) On the Volga at Volgagrad (Stalingrad).

(iii) On the lower Dneiper, with a canal running across the Ukrainian steppes to the north Crimea.

(iv) The Volga-Don canal, with large irrigated areas near Rostov and near Volgagrad.

(v) The Turkmenian canal, to run for 600 miles across the Kara Kum Desert and irrigate for cotton an area nearly as large as England and Wales.

Fig. 99. THE WATERWAYS, IRRIGATED AREAS AND MAIN HYDRO-ELECTRIC STATION OF THE VOLGA DEVELOPMENT PROJECTS.

(5) THE COMBAT WITH DROUGHT.—Surrounding the desert zone of Russia is a region extending from the lower Volga eastwards into Asia where the mean annual rainfall varies from 8 to 15 inches. This is, agriculturally, one of the most critical regions in Russia, both because the annual rainfall is subject to great variations from year to year, and because it is the region with some of the richest soils in the country. In the past the peasant farmers were helpless in face of a rainfall

shortage and the resultant famine due to poor yields. For instance, in 1919, a year of average rainfall, the yield of wheat per acre was 16 bushels, but in 1920 it fell to 4 bushels per acre, and in 1921, the year of great famine, was less than one-third of a bushel per acre.

Special drought-resisting crops have been introduced into these "famine" zones, including drought-resisting varieties of the principal cereals. Dry farming methods are being practised in order to make the most profitable use of the water in the soil, and to avoid soil erosion by wind.

(6) SOIL IMPROVEMENT.—Over large areas, particularly in the northern half of Russia, the soils are, by nature, infertile. In other regions the persistence of one crop cultivation and the lack of manuring have exhausted the natural fertility of the soil.

The fertility of these soils is being improved by the use of lime and fertilisers and by the adoption of scientific crop rotation.

The U.S.S.R. is fortunate in possessing vast reserves of both potash and phosphates, and nitrogen fertilisers are readily prepared synthetically if adequate electrical power is available.

(7) POLAR AGRICULTURE.—The regions beyond the Arctic Circle were formerly considered as being entirely unsuitable for agriculture. Although the summers are cool the summer days are long and the duration of daylight partly compensates for the low temperatures. A large variety of crops is now being cultivated in these northern areas. They include vegetables such as cabbages, onions, turnips, carrots, potatoes, etc., but in addition, special varieties of barley, wheat and oats have been successfully ripened. Igarka, a new port, at the mouth of the Yenesei, has its own local supply of fresh vegetables. Even the nomads of the tundra are in some districts growing fodder grasses and rearing cattle as well as reindeer.

Under Arctic conditions, however, agriculture is an economic proposition only on a small scale for supply to centres of population engaged in special tasks such as mining, etc.

(8) NEW CROPS.—A vast amount of experimental work has been done to find out which crops not originally cultivated in

Russia could profitably be acclimatised, the aim being to make the country as far as possible self-sufficient. The only plants that have not been acclimatised are the purely tropical ones such as coffee, cocoa and bananas.

(9) REDISTRIBUTION OF CROPS.—Before 1914 the cultivation of most of the principal crops of Russia was almost exclusively limited to certain areas, *e.g.* wheat in the Ukraine, cotton in Turkestan, sugar-beet near Kiev. Moreover, agriculture was limited in its distribution. A line from Kiev to Sverdlovsk divided European Russia into two zones, an agriculturally productive zone in the south, and to the north a consuming region which produced little except rye and flax.

It is one of the aims of Soviet Russia to extend the cultivation of crops into other areas which are suitable for their production. In particular, great attention has been given to the wider regional distribution and increased production of wheat, sugar-beet, cotton and rice (Fig. 100).

(*a*) *Wheat.*—The chief changes in the distribution of wheat lands are as follows:—

In European Russia wheat cultivation is no longer limited to the rich Black Earth lands of the south. By clearing the forest, adopting scientific methods and by sowing grain suited to the cooler but longer days of the more northerly latitudes, the cultivation of wheat has been rapidly extended to the north of the Kiev-Sverdlovsk line. The northern extension of wheat cultivation in European Russia has now reached 60° N. and may be compared with the northern extension of wheat production in Central Canada.

The increase of wheat cultivation has been very rapid in West Siberia in the regions of rich black soil extending from the southern Urals eastwards to Semipalatinsk.

In East Siberia the original annual deficit of wheat is decreasing in spite of the increase in population.

Only in one large area is there any marked decrease in wheat production. This is in Tadzhik, Uzbek and Turkmen in Central Asia. This region, because of improved transport facilities (the "Turk-Sib." Railway), can now obtain supplies from the wheat lands around Semipalatinsk, and the irrigated lands can now be used for the cultivation of other crops such as rice, cotton, etc.

In spite of the rapid extension of wheat cultivation in other areas, the Ukraine remains the leading wheat region, accounting for almost one-fifth of the total acreage and about a quarter of the total crop. Other important wheat regions are Kazakstan, the North Caucasus, Western Siberia and the Urals. Between 1954 and 1956 the area planted to wheat increased by an area greater than that of England and Wales, mainly by the ploughing up of virgin steppe.

(*b*) *Sugar-beet.*—At one time the cultivation of sugar-beet in Russia was almost entirely limited to the region between Kiev and Kursk. Although these still remain the chief areas,

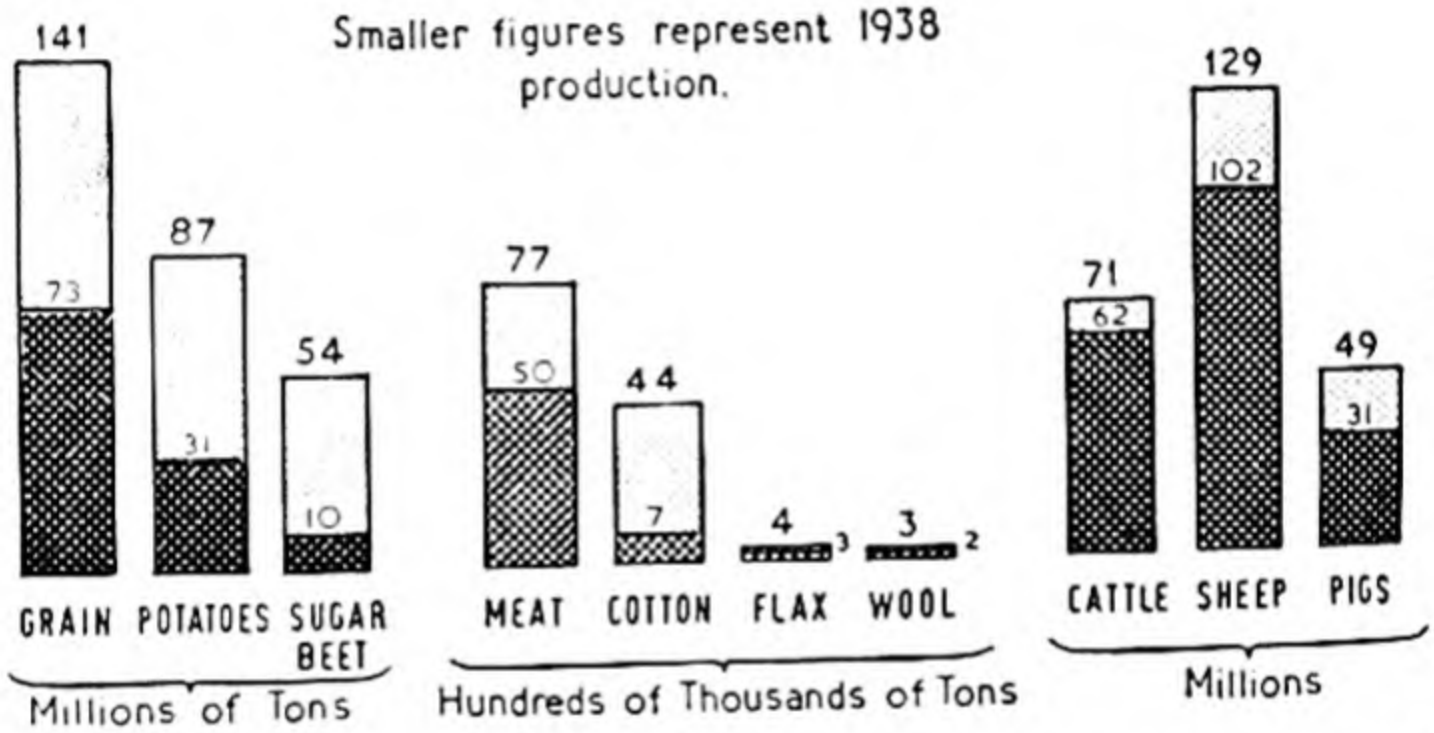


Fig. 100. PRODUCTION OF THE CHIEF AGRICULTURAL PRODUCTS IN THE U.S.S.R. IN 1958 COMPARED WITH 1938. (N.B. The vertical scales of the above columns are not uniform.)

sugar-beet is now cultivated in Transcaucasia, in the Volga area, in West Siberia (where it is grown under irrigation) and in the Far East, as well as in other parts of south and central European Russia. Nearly six million tons of beet sugar are produced annually, about two-thirds of it in the Ukraine.

(*c*) *Cotton.*—Originally cotton cultivation was limited to Transcaucasia and the oases and irrigated land of Russian Turkestan. Much of the raw cotton necessary for the cotton industries of the Moscow region had to be imported. Production is now second only to that of the U.S.A. and considerable amounts of raw cotton are exported. The Russian

yield per acre is by far the highest in the world. To-day, cotton is also cultivated:—

(i) In the Crimea, (ii) to the north of the Black Sea, (iii) to the north and east of the Sea of Azov.

The rainfall of these regions is far from heavy and cotton cultivation has only become possible by the introduction of special drought-resisting varieties. The northward limit of cotton cultivation has thus been moved from lat. 43° N. in Central Asia to lat. 47° N. in European Russia. The total area under cotton has increased four-fold in the last forty years. Uzbekistan produces two-thirds of Russia's cotton, and Tadjikistan, Turkmenistan and Azerbaijan one-tenth each.

In addition, much has been done to increase the acreage and yield of plants formerly cultivated only on small areas. Thus there is a great increase in the cultivation of tea in the Batum region; of lemons and oranges in the Crimea and on the eastern coastlands of the Black Sea. Many different kinds of sub-tropical plants are being grown experimentally in the Central Asiatic regions of Russia, *e.g.* Tadzhik, Kirghizia, etc.

(10) ANIMALS.—While the development of agriculture was prominent in the First Five-Year Plan, the improvement of animal industries was a special feature of the Second Five-Year Plan. Herds were improved by the introduction of new stock from abroad, and milk yields were raised, and cattle rearing is being introduced into areas where it has hitherto been of little importance, viz. in the northern lands and in the East of Siberia. As in other parts of Europe dairy-farming areas are developing near to the industrial centres, viz. near Moscow, in the Ukraine and in West Siberia (for the Kusnetsk region). Similar careful attention is being paid to the rearing of horses, sheep, goats and pigs. In the semi-arid districts north of the Caucasus and to the north and east of the Caspian Sea there is a very rapid increase in the numbers of black Astrakhan sheep. The tightly curled fleeces of Astrakhan lambs command good prices for use in the clothing trade. Russia now has nearly 60 million pigs, 75 million cattle, and 130 million sheep. Nevertheless, in stock-raising, Soviet planning has been much less successful than in many other fields, and it is only in the last few years that there has been any appreciable increase in the numbers of livestock and even

now the numbers of cattle and cows are not very much larger than in 1916. Milk yields are still low although improving. The number of cattle and cows per head of population is about the same in Russia as in the United Kingdom, but it should be remembered (*a*) that milk yields are very much higher here than in the U.S.S.R., and (*b*) that about half our beef and a large part of our butter and cheese is imported.

Most of the live stock is in European Russia, with the raising of pigs important in the west, and of sheep on the drier grasslands of the south-east. Dairy farming is more important in the north, and beef cattle are reared in the steppe lands on grass and in the Ukraine on fodder crops.

Not only domestic animals, but wild animals also, are regarded as a valuable national asset. The northern forests once possessed almost unlimited numbers of fur-bearing animals. In the past the hunting of these animals was so unrestricted that in many regions the most valuable animals were almost exterminated. Hunting is now an organised industry, and protective measures are enforced to prevent the further reduction of the numbers of certain animals.

As a result of the above measures vast changes have taken place in Soviet agriculture. By the application of modern and mechanised methods of cultivation on the larger units obtained by collectivisation, the number of agricultural workers needed was greatly reduced, thus enabling many millions to be transferred to the rapidly expanding industries of the towns. Although there has been some extension of farming both northwards and to the south-east, the chief increase in arable area has come from the ploughing up of steppe grasslands. Between 1953 and 1956 this programme was expanded on a vast scale, over 150,000 square miles coming under the plough, much of it for wheat and maize. Until then there had been no great increase in the production of foodstuffs which had done little more than keep pace with the 3,000,000 annual growth of population. While the overall crop area has increased about 70 per cent. since 1913, that devoted to cereals has increased until recently only 25 per cent. Instead, an ever-increasing area has been devoted to the growing of industrial crops such as cotton, flax and oil seeds (over 1 million tons of sunflower-seed oil are obtained), rubber-yielding shrubs,

potatoes for alcohol, all raw materials for the expanding industries, and of fodder plants, for the raising of livestock for wool, leather and meat (see Fig. 100). The tendency has been to try and make each region as agriculturally self-supporting as possible so as to reduce the strain on communications.

Present Distribution of Chief Agricultural Crops in European Russia

From the agricultural point of view European Russia may be divided into seven zones (see Map, Fig. 101).

1. THE TUNDRA OF THE NORTH.—Here little cultivation is possible. In these regions experiments have been made in growing potatoes and vegetables.

2. THE CONIFEROUS FOREST BELT OF INFERTILE PODZOLS.—In the forest clearings agriculture is being developed by scientific means similar to those used on the poor soil areas of Sweden and Denmark. The chief crops are oats, rye and potatoes. Dairy farming is increasing rapidly and special varieties of wheat have been grown near Leningrad and nearly as far north as Archangel.

3. THE DECIDUOUS FOREST ZONE.—Here most of the forests have been cleared and the soils, though marshy, are, when drained, more fertile than the podzols farther north. The chief crops are flax, rye and oats. In recent years there has been a rapid increase in dairy farming. Formerly little or no wheat was grown in this region but it is now grown increasingly in the latitudes of Moscow and Gorki, and sugar-beet is also grown.

4. THE STEPPE LANDS.—This is the richest agricultural land of Russia and by far the most important crop is wheat. The yield per acre and total output are increasing. Sugar-beet is a second crop of importance especially around Kiev and Kursk, but its cultivation is extending eastwards. Soya beans have been introduced to the southern Ukraine and these, as well as the ubiquitous sunflower, are an important source of vegetable oil. In the hotter areas of the extreme south special varieties of cotton are being successfully grown.

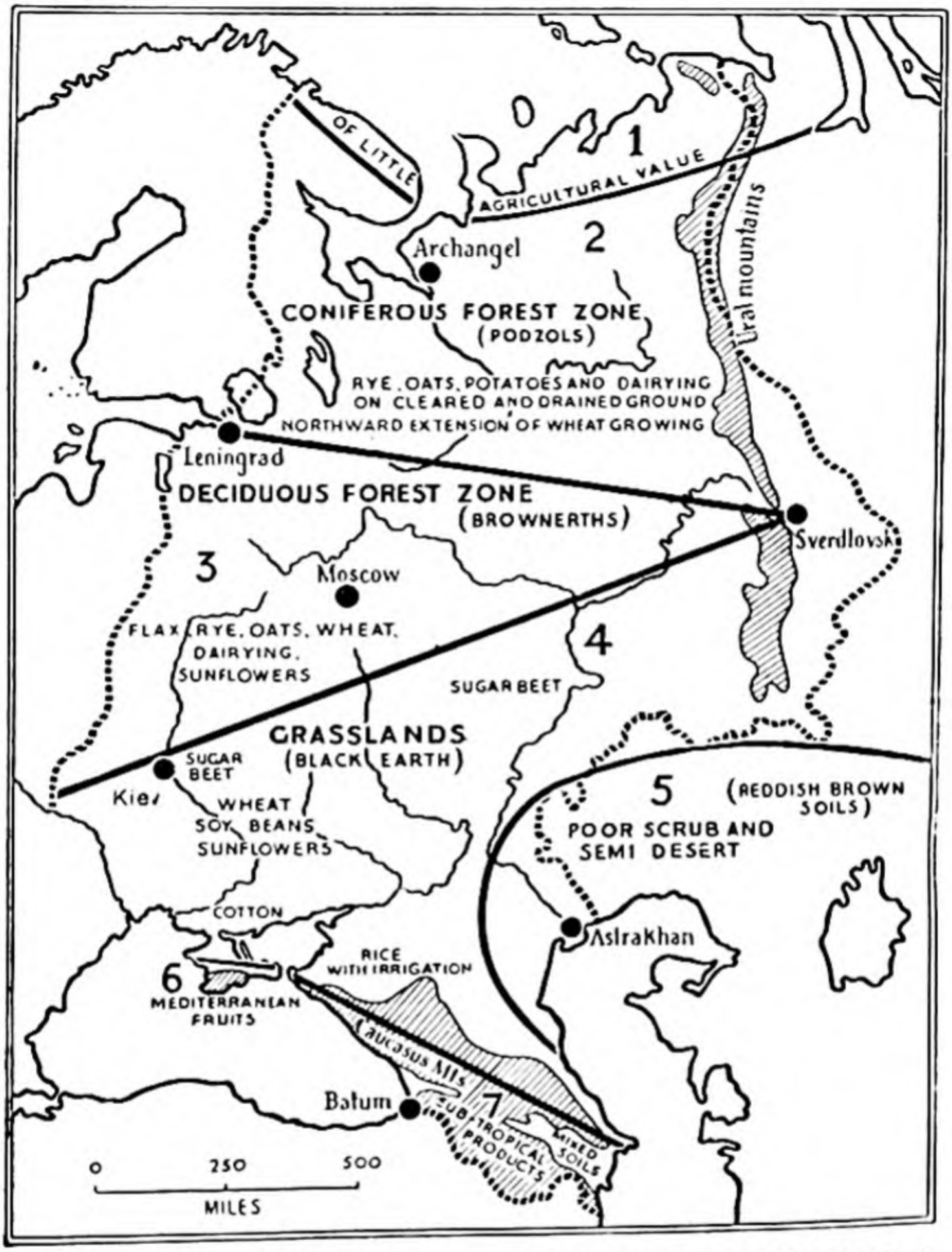


Fig. 101. U.S.S.R. (EUROPE ONLY). DISTRIBUTION OF AGRICULTURAL CROPS.

5. THE ARID STEPPE.—Here water is scarce but agriculture is developed by means of irrigation. Land formerly unproductive is producing wheat, cotton and rice.

6. THE SOUTHERN CRIMEA.—This region has a climate very similar to that of the Mediterranean regions. Here are grown

most varieties of Mediterranean fruits, oranges, grapes, almonds, etc.

7. TRANSCAUCASIA.—This region has higher temperatures in both summer and winter than the rest of European Russia. The agricultural products are sub-tropical in type. Fruits, cotton, silk, and tobacco are some of the important crops. Cork oak has been introduced from Algeria. Tea is grown near the Black Sea coast.

CHAPTER XXII

UNION OF SOVIET SOCIALIST REPUBLICS: MINERALS AND INDUSTRIAL DEVELOPMENT

Mineral Resources

The discovery and exploitation of Russia's mineral wealth is one of the greatest achievements of the Soviet régime. The U.S.S.R. now ranks first for production of iron ore, lead, bauxite (for aluminium), platinum, manganese, and phosphates; second for coal, copper, tin, zinc, and gold; third for oil; and fifth for silver. Despite her great industrial production she is self-supporting both for fuel and for minerals, and is able to export oil, manganese and iron ores, tin, and potash and phosphate fertilisers.

The mineral resources of Russia may be divided into three groups:—

(*a*) Coal, (*b*) oil, (*c*) other minerals including the metal ores.

(*a*) COAL.—The coal reserves of Russia are widely spread and second only to those of the U.S.A. The increase in annual output is shown by the following figures:—

Year	millions of tons
1913	29
1934	93
1947	165
1950	265
1958	496
1960	519

The above figures include all grades of coal, including lignite (brown coal). In 1958, lignite accounted for 143 million tons and of the remainder 78 million tons was anthracite. More than a quarter of the coal is open-cast mined. As a producer of coal Russia is a close second to the U.S.A. Her output is more than twice that of the United Kingdom and is still increasing rapidly.

In 1939, one coalfield, the Donetz, accounted for nearly 90 per cent. of the Russian output. This modern "Donbas" region is still the most important and most actively developed

coalfield of Russia. But although its present output of coal is nearly six times that of 1913, it is no longer the only important coal mining area, and produces only about one-third of the coal mined in the U.S.S.R. (see Table on page 252). Nearly half the output of the Donbas, however, is anthracite.

The coalfield with the second largest output is the Kuznetsk (Kuzbas) region of West Siberia (S.E. of Novosibirsk) which produces a variety of coal in thick seams near the surface, including anthracite and some good coking coals. Its rapid

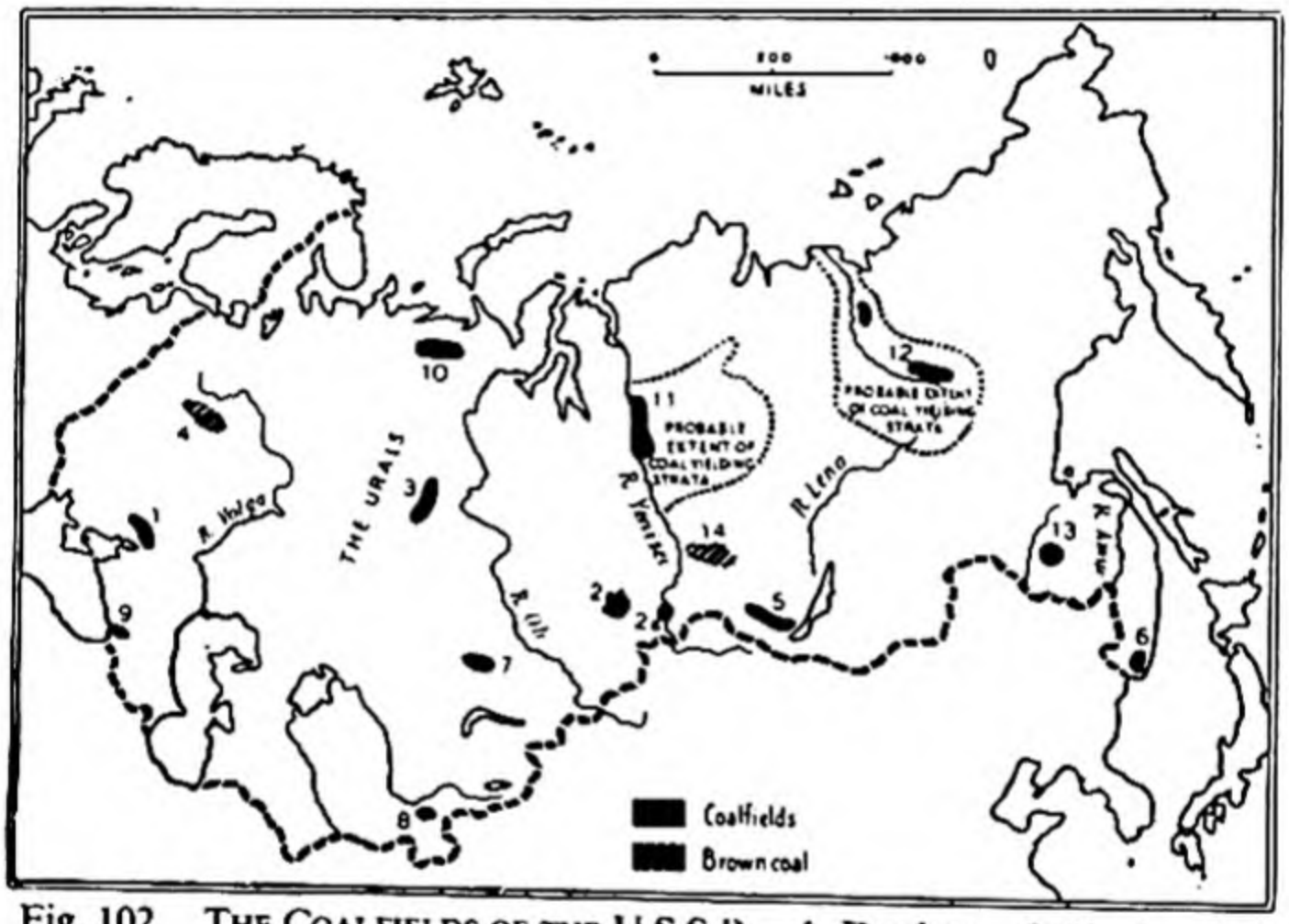


Fig. 102. THE COALFIELDS OF THE U.S.S.R.—1. Donbas. 2. Kuzbas and 2*a*. Minusinsk. 3. Ural. 4. Moscow (brown coal). 5. Irkutsk (East Siberia). 6. Vladivostok (Far East). 7. Karaganda. 8. Central Asia. 9. Transcaucasia. 10. Pechora. 11. Tunguz (East Siberia). 12. Yakut. 13. Bureinsk (Far East). 14. Kansk (brown coal).

development in the last fifteen years has led to the growth of a great industrial area in the mid-Siberian steppes. Some seven hundred miles to the south-west lies another new coalfield, that of Karaganda, which now ranks sixth. Third and fourth in order of production are the Ural and Moscow coalfields but much of this coal is very low grade, suitable only for utilisation by power stations specially designed to use it. Local supplies are insufficient for the needs of the large industrial regions in these areas, and coal has to be hauled to the former from the Donbas, and to the latter from

Karaganda and Kuzbas, a journey of nearly one thousand miles in each case.

PRINCIPAL RUSSIAN COALFIELDS:—PRODUCTION

COALFIELD	1913	1950	1958
	Millions of Tons		
Donbas	25	90	182
Kuzbas	1	32	75
*Ural	1	30	61
*Moscow	—	30	47
East Siberia	1	27	36
Karaganda	—	20	24
Far East	—	10	20
Pechora	—	5	17
Others	1	21	34
Total	29	265	496

* In these areas the percentage of brown coal or lignite is high.

The Yenesei and Lena basins (Tunguz and Yakut) are known to have vast reserves of coal, but investigation of these areas is, as yet, incomplete, and at present only sufficient is mined to meet small local needs.

The Pechora coalfield lies in the tundra region of the north of European Russia. While it was formerly thought that coal existed there, the inaccessibility of the region prevented its investigation and exploitation. Output is now 17 million tons a year, conveyed southwards by the new North Pechora railway.

In the Urals, coal mining was originally limited to the brown coal district near Chelyabinsk, but coal deposits have now been discovered and exploited in the Sverdlovsk region, and these include anthracite.

The opening-up of the Asiatic coalfields is of great importance in relation to the fuel supply of the Trans-Siberian railway. This is especially true of the Kuzbas, Minusinsk, Irkutsk, Bureinsk and Vladivostok coal deposits.

The Far Eastern coalfields will also be important in relation to Northern Pacific shipping routes and as the basis of industrial development in a region remote from other manufacturing areas.

Peat.—Extending from the Polish border eastwards to the Urals are vast peat deposits. Until recently these have not been utilised, but already Russia ranks as the first producer and consumer of peat. It is used primarily as fuel in the regions poor in coal, and in electric power stations.

(*b*) Oil.—The Russian oilfields of Baku (see plate facing page 224) in Transcaucasia have long been famous. The oil wells of Baku on the south side of the Caucasus, and of Grozny and Maikop on the north side, used to account for 96 per cent. of the total Russian output of oil. There are still large reserves, but output is now less than a few years

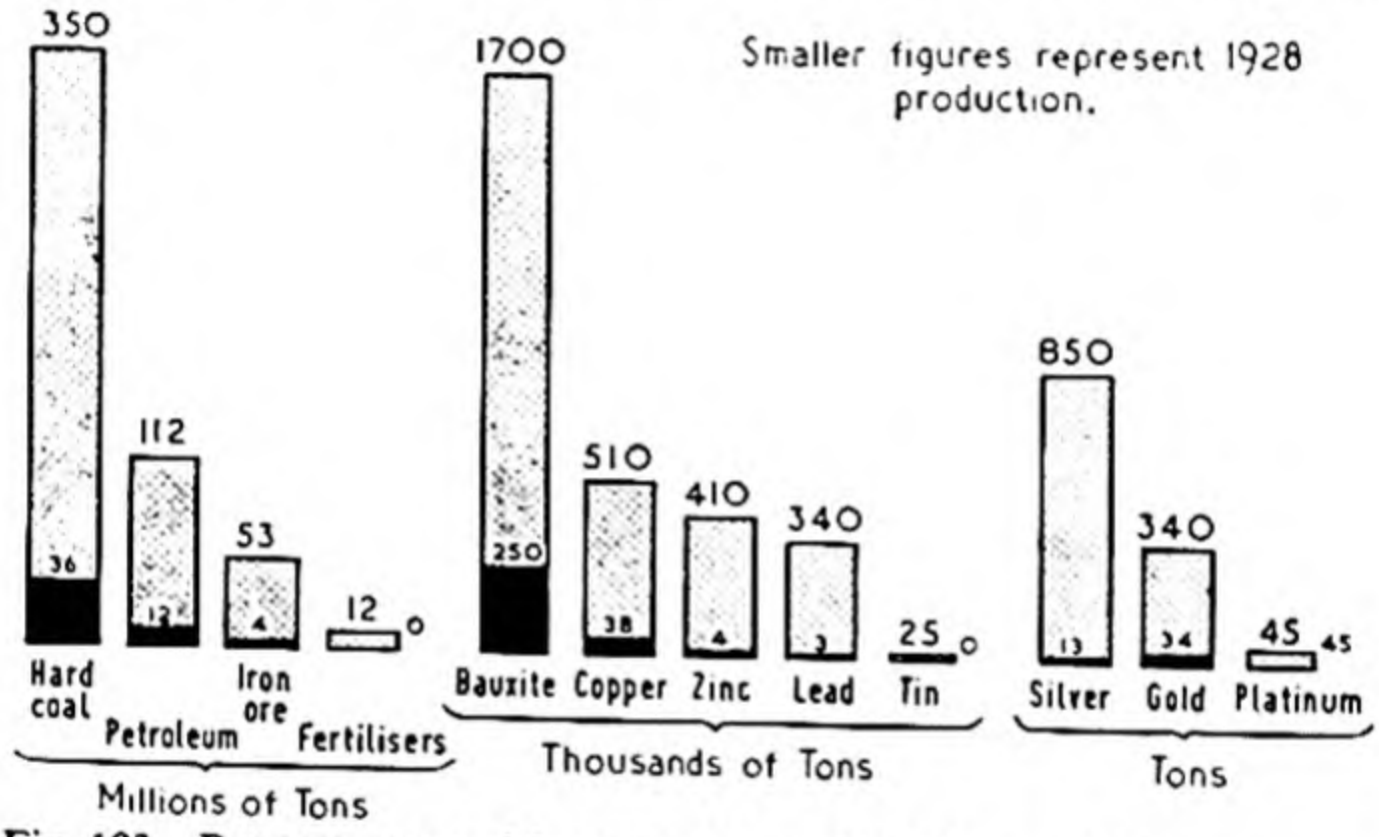


Fig. 103. Production of Minerals in the U.S.S.R. in 1958 Compared with 1928. (N.B. The vertical scales of the above columns are not uniform. For ores, the figures represent metal content.)

ago. Nowadays less than one-fifth of Russia's oil comes from this area, and, except for a few million tons from Asiatic wells and about 7 million tons from oil shale in Estonia, all the remainder comes from the "second Baku", a rich oil belt stretching from the Volga to the Urals.

Russia has vast oil reserves. Large deposits have been found throughout the Donetz-Dneiper depression, in Uzbekistan and Turkmenistan and in the lowlands around the Baltic depression. Russia plans to double her already large production in the next five years and to become a large-scale exporter. By 1959 exports to the West had already reached 25 million tons a year. To facilitate export, a crude

oil terminal is being built on the Baltic at Klaipeda (Memel) and a large refinery and refined-oil port at Ventspils (Windau). A pipe-line is being built from Kuibyskev westwards through the Ukraine with northern branches to supply the above ports, Poland and East Germany, and a southern branch to Hungary and Czechoslovakia.

There is a pipe-line from Tuimaza to Omsk (837 miles) and another 30-inch pipe-line under construction from Tuimaza to Irkutsk (2,300 miles) to feed Siberian industry with oil from the Volga-Ural oilfield.

Associated with oil is natural gas which can be used to generate industrial power. Russia's production of natural gas in 1960 was 1,600 thousand million cubic feet, making her second world producer.

(*c*) MINERAL ORES.—In addition to her reserves of coal and oil Russia is rich in many other minerals. Russia produces 2 million tons of manganese, nearly half the world's supply.

The most important mineral regions are (Fig. 104):—

(1) The Urals, where in addition to coal and oil there are deposits of iron, copper, gold, bauxite, nickel, manganese, platinum, potash and thorium.

(2) The Caucasus region—with important deposits of copper, aluminium, nickel and iron.

(3) The mountains of Uzbek and Tadzhik where copper, gold, lead and zinc are obtained.

(4) The mountain regions between Lake Balkhash and Lake Baikal yielding gold, lead, zinc, iron and manganese.

(5) Kazakhstan, which has large deposits of a very wide range of minerals, including copper, lead, zinc, aluminium, tin, gold and silver.

(6) The Lena basin which has rich gold deposits.

(7) The Kola peninsula which produces large quantities of phosphate fertiliser.

(8) Just north of the Caspian, with large potash deposits.

(9) In Yakutia a very rich diamond field, claimed to equal that in South Africa, was discovered in 1954.

The estimated mineral reserves are so abundant that Russia has apparently greater resources of iron, manganese, phosphates, potash, and oil than any other country.

The principal iron ore regions are:—

(1) At Krivoi Rog, in the Ukraine, at present much the most important area, production is about 40 million tons a year of good quality haematite and accounts for two-fifths of all Russian output.

(2) An area in the Southern Urals around Orsk and Magnitogorsk, producing one-third of Russian output.

(3) At Kerch in the Crimea, where reserves are enormous and occur in beds nearer the surface than at Krivoi Rog, but have a lower metallic content. The area produces one-sixth of the total Russian output.

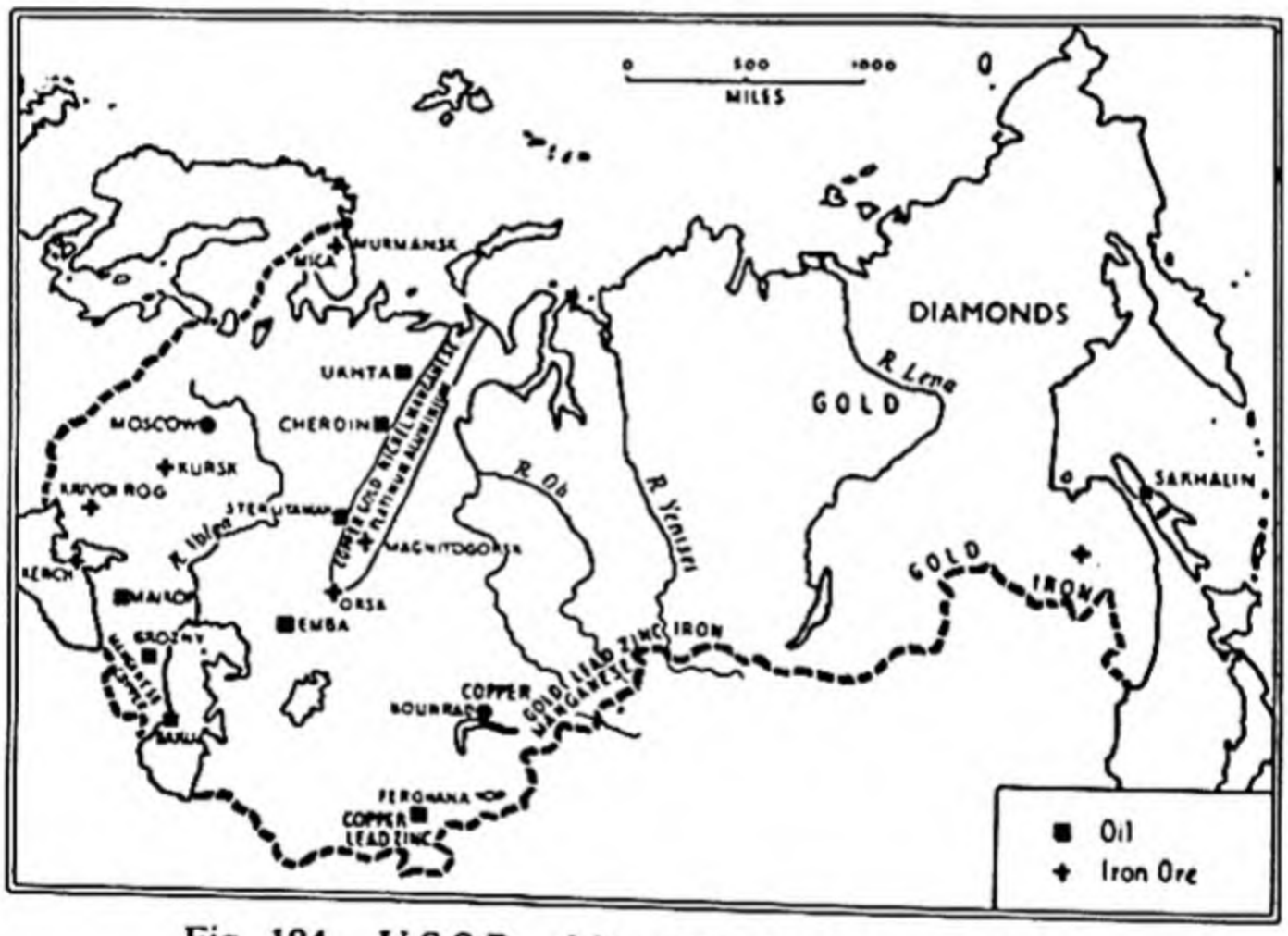


Fig. 104. U.S.S.R. MINERALS OTHER THAN COAL.

(4) Smaller amounts are obtained at Telbes (in the Kuzbas), in the neighbourhood of Kursk (south of Moscow), in Azerbaijan, and near Murmansk.

Water Power and Electricity

Russian production of electricity is twice as great as that of the United Kingdom, but because of her much greater population is only half as much per head. Most of this electricity is generated in power-stations burning coal, brown coal, or

peat, but about one-fifth is hydro-electricity, and this proportion is increasing. There are great reserves of potential water power but most of this is in sparsely-populated areas of Asiatic Russia, where the cost of development is greater owing to lack of railways, roads, etc., and where there is little demand for industrial power. It is not surprising, therefore, that Soviet electrical engineers are particularly interested in the development of long-range transmission of electricity.

The chief groups of electric power-stations are:

(1) Around Leningrad.

(2) In the Moscow region.

(3) In the Ukraine.

(4) In Transcaucasia.

(5) In the Urals.

(6) In Kuzbas.

The chief hydro-electric centres are:

(1) The famous power-station at Dnieproges on the River Dnieper about 60 miles south of Dniepropetrovsk (see Fig. 107), destroyed by the Russians during the war to prevent it falling into German hands and since rebuilt.

(2) Two large hydro-electric centres in the neighbourhood of Leningrad, on the River Volkhov and on the River Svir.

(3) Near the north-west corner of the White Sea on the River Niva.

(4) In the Caucasus mountains.

(5) In the Volga basin with hydro-electric stations near Yaroslav (400,000), Gorki (950,000) and Perm (Molotov, (625,000).

(6) At Tsimilyanska on the lower Don, part of an irrigation scheme for an area of 10,000 square miles south of the Don and the Volga-Don Canal from Rostov to Volgagrad.

A large power-station with a capacity of two million kilowatts was completed in 1957 at Kuibyshev and a similar one at Volgagrad in 1960. Even larger schemes are now being planned for Bratsk on the Angara, and Krasnoyarsk on the Yenesei, in Asiatic Russia. In order to conserve the heavy flow from the spring thaw and provide for the vast quantity of water required for irrigation in the dry summer,

the Volga has been dammed back into a series of huge lakes. One of these near Kuibyshev and another near Volgagrad is over 300 miles long and 20-25 miles wide. These four new stations alone will produce considerably more hydro-electricity than the whole of France.

In Asiatic Russia greatest progress has been made in Kazak and Uzbek, where the swift-flowing mountain streams offer great possibilities for providing electric energy. 75 per cent. of Russian industry depends mainly upon electricity as a source of power, and output in the more important regions such as Moscow is comparable with that of the great Niagara system in America.

The Industrial Development of Russia

(1) EARLY INDUSTRIAL DEVELOPMENT.—It has already been shown that Russia has striven to organise her agricultural and mineral resources. She has made even greater efforts to develop manufacturing industries.

Whereas thirty years ago industrial activity was much less important than agriculture, to-day industrial enterprises are very much more important than agriculture, even though the latter has itself increased considerably.

In Tsarist Russia manufacturing was not only relatively unimportant but it consisted mainly of home industries and was entirely confined to European Russia.

More than 50 per cent. of Russian manufacturing industries were located in the region of Leningrad, Moscow, Ivanovo and Gorki. There was a second industrial zone in the Ukraine on the Donetz coalfield which utilised the iron ore of Krivoi Rog and some of the mineral ores from the Urals. The Urals, themselves rich in minerals, had few metallurgical centres, but acted as a source of raw material for the small metal works of the Ukraine and Moscow districts. The same was true of Central Asia (Turkestan) which produced cotton for the mills of the Moscow region, but did not manufacture cotton goods. Thus, in the past the raw materials of the whole of Russia were tributary to the industrial areas of the European section.

(2) MODERN INDUSTRIAL DEVELOPMENT.—The Soviet reorganisation aims at effecting a widespread redistribution of

industries throughout the country, so that the European area will no longer have an industrial monopoly. This policy, useful both by relieving strain on the transport system by making widely-separated regions more nearly self-supporting, and as a safeguard in time of war, received a great impetus on the German invasion of Russia in 1941. During the war the industrial production of the Volga, Urals, and Siberian industrial areas increased three- to four-fold. It has been shown that the output of coal, iron ore, petroleum, mineral ores and peat has increased very rapidly (Fig. 103). The industries based on these materials are being developed with equal speed (Fig. 105). Russia already ranks as the second

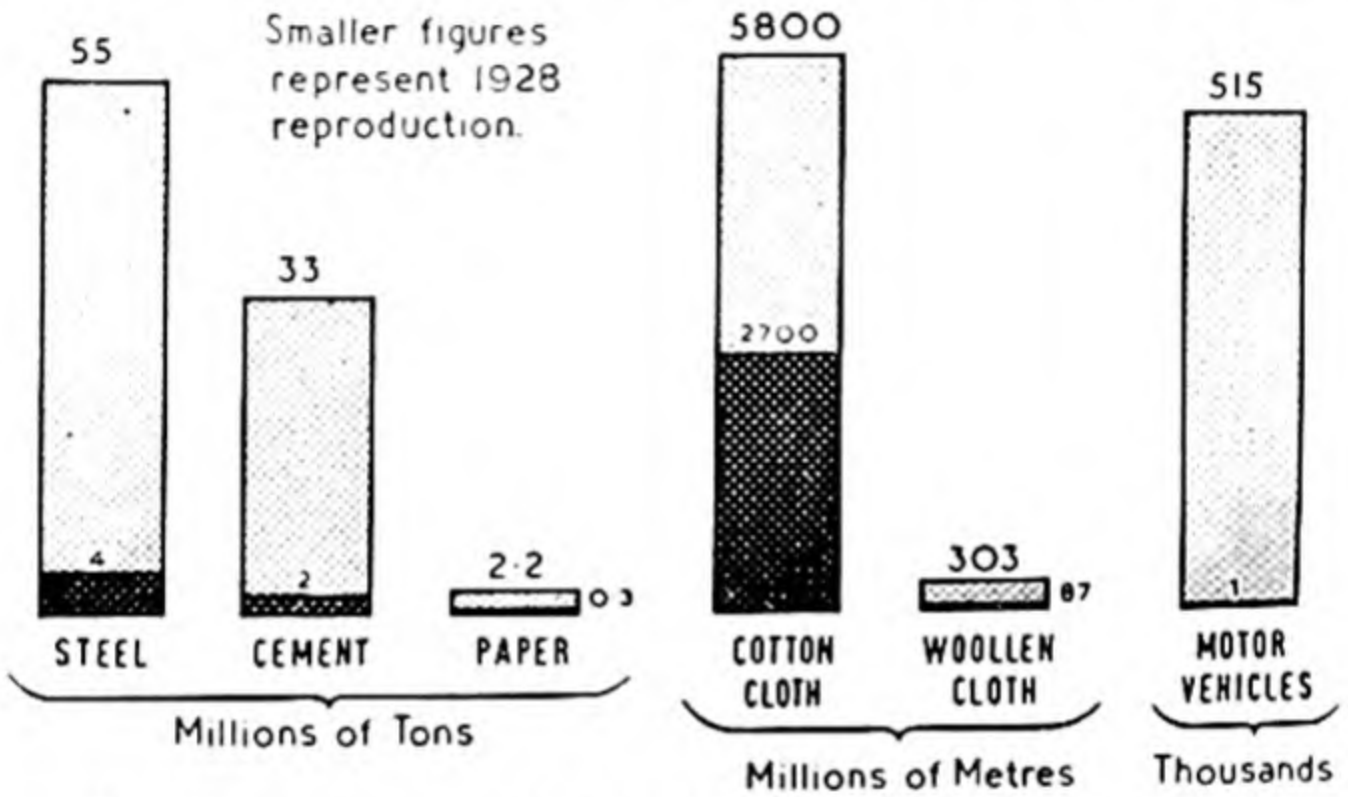


Fig. 105. PRODUCTION OF VARIOUS MANUFACTURES IN THE U.S.S.R. IN 1958 COMPARED WITH 1928. (N.B. The vertical scales of the above columns are not uniform.)

producer of pig-iron and steel in the world. Progress in engineering, in the textile industries and in the manufacture of wood products, leather, etc., is almost equally great.

Large-scale development is one of the characteristic features of modern Russia; and already a number of industrial concerns rank as among the largest of their kind in the world, *e.g.* the Dnieproges hydro-electric station; the Rostov tractor works; the Moscow truck factory; the Gorki motor works, etc. Modern Russia is a country of impressive figures and immense undertakings, and the majority of the industrial population are employed at works with more than one thousand employees.

Until comparatively recently the main emphasis in Russian industrial reorganisation has been on the heavy and constructional industries and on the manufacture of such things as machinery, farm implements, motor tractors, etc. In the last few years there has been increased attention devoted to lighter industries and the production of consumer goods, *e.g.* clothing footwear, furniture, radio and household equipment of all kinds, to raise the standard of living of the people, which by Western standards is still very low.

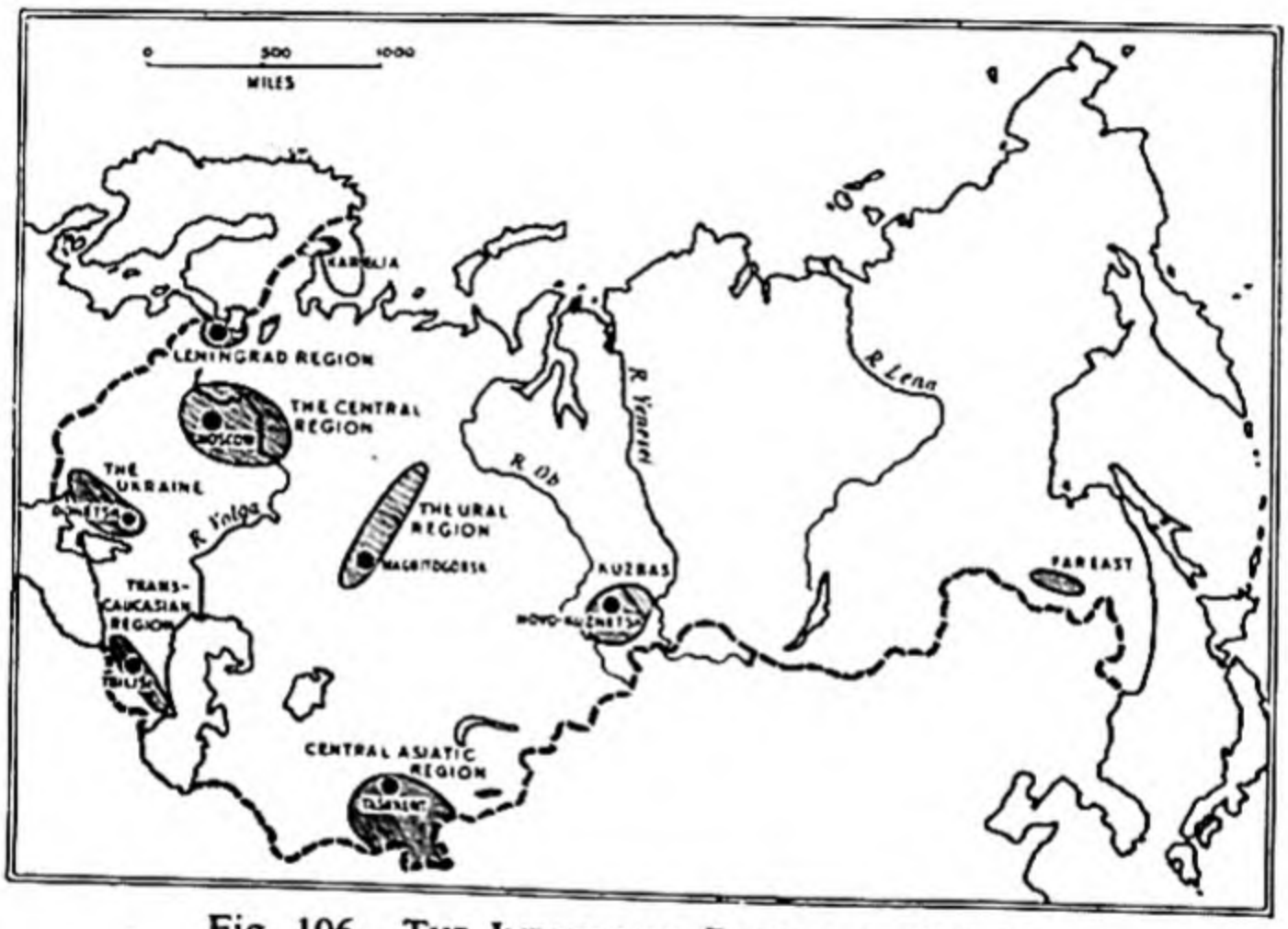


Fig. 106. THE INDUSTRIAL REGION OF U.S.S.R.

The chief industrial areas of modern Russia are (Fig. 106):—

(1) The Moscow-Ivanovo-Gorki region in the centre of European Russia.

(2) The Donbas region of the Ukraine.

(3) The Urals.

(4) The Leningrad region.

(5) The Kuzbas regions of Siberia.

(6) Transcaucasia.

(7) Central Asia in Uzbek and Tadzhik.

The Moscow Region

In Tsarist Russia the Moscow region was responsible for over 50 per cent. of the manufactures of the country and it still remains the most important industrial area, producing about one-sixth of Soviet industrial output.

This district (Fig. 107) includes the towns of Moscow, Yaroslav, Tula, Lipetsk, Novo-Moskovsk (Stalinogorsk), Voronezh, Gorki, Kalinin and Ivanovo. It has a population of eighteen million, about three-quarters of them urban. In contrast to the industrial regions of Britain, the towns of the premier industrial area of Russia are long distances apart, *e.g.* Tula is over 100 miles from Moscow, and Gorki over 200 miles distant.

Fig. 107. THE MOSCOW INDUSTRIAL REGION.

The early development of manufacturing in this region was primarily due to the fact that it was virtually the geometric centre and the route centre of European Russia. The brown coal deposits of the Tula district were of poor quality and considered to be practically useless for industry. Also there were no deposits of metal ores. Coal was brought from the Donetz coalfield and cotton from the Tashkent region of Central Asia. In spite of obvious drawbacks such as the lack of local supplies of fuel and raw material, the Moscow region was responsible for 99 per cent. of the cotton manufactures of Czarist Russia, and nearly all the manufactures of wool and leather.

Formerly, no pig-iron was produced, but now there is a considerable output. Most of the iron ore is obtained from Kursk, and other metal ores are brought from the Ural region.

To-day hydro-electric power from power stations on the upper Volga, and thermo-electric power from power stations

specially constructed to deal with peat and the local low-grade coal, help to reduce the demand for Donbas coal and Baku oil, which has to be hauled over 1,000 miles. But this still accounts for about two-thirds of the industrial fuel used in the area, and shortly before the war of 1939-45 a special direct railway from Moscow to the Donbas was constructed to carry coal.

The region still maintains it position as the most important Soviet textile area, although now by no means the only one. The chief cotton centres are around Moscow and Ivanovo (330,000) (the Manchester of Russia). Linen is manufactured around Ivanovo and Kalinin from locally-grown flax.

The central industrial region has now acquired large-scale metal industries. These include the making of machinery for other industries, the manufacture of motor-cars, railway engines, aeroplanes, electrical equipment, ball-bearings, etc. There are important metal works at Tula (345,000) and Lipetsk; motor-cars are made at Moscow and Gorki; Briansk and Kolomna specialise in the manufacture of locomotives and machinery; while at other centres are manufactured river steamers, escalators, watches, microscopes, and a great variety of scientific apparatus. The region tends to specialise in precision machinery and instruments, calling for skilled craftsmanship.

In addition to the textile and metal industries, the Moscow area is responsible for over 60 per cent. of the newly-created chemical industries. Formerly Russia imported chemicals from other countries and manufactured none herself. This branch of industry has grown rapidly and includes the production of chemicals from coal and peat, the manufacture of fertilisers and sulphuric acid, the distillation of alcohol from potatoes (which are extensively grown in the central area of European Russia) and the manufacture of synthetic rubber. The latter industry, located at Yaroslav and Voronezh (450,000), has proved very successful.

Moscow (5,000,000) is not only the centre of the greatest region of industrial development but is the capital of "all the Russias" (see plate facing page 225). It was established as a fortress on the River Moskva in the eleventh century. Its position in the open forest zone gave it protection from the nomadic peoples of the grasslands to the south. From this

centre, partly because of the ease of transport along the valleys of the many tributaries of the River Volga, and partly because of its central position, the power of Muscovy spread in all directions. To-day it is the great nodal centre of Russian routes and from it railways diverge to Leningrad, Riga, Warsaw, Kiev, the Ukraine, Central Asia, Siberia, the Urals and Archangel. In 1703 St. Petersburg (modern Leningrad) was founded as a new capital during the period of Western expansion, but because of its more central position and historical significance, Moscow again became the capital in 1927. It is a great industrial centre. In addition to textiles and metal goods it also manufactures woollen goods, leather goods, paper, motor cars, etc.

The Ukraine

The southern section of European Russia is not only the richest agricultural area of the U.S.S.R., producing immense crops of wheat, sugar-beet, sunflowers (for oil-seeds) and cotton, but it contains the most productive Russian coalfield, Donbas; the largest hydro-electric power station (the Dnieprostroi); has rich deposits of iron ore (Krivoi Rog and Kerch); and is within easy reach of oil-producing regions (Maikop, Grozny and Baku). Because of its natural advantages, *i.e.* sources of power, supplies of iron ore and oil, easy communication across the treeless steppes, and its fertility, this is the most densely-populated area of the whole country. The population is over 42 millions, and has recently been increased by the inclusion of Bessarabia. The average density of population (185 per square mile) is, however, small compared with that of the industrial areas of Western Europe, but rises to 300 in the Donbas.

In South Russia there are four distinct centres of industrial development (Fig. 108).

(1) THE DONBAS.—Immediately to the south of the River Donetz is an extensive coalfield over two hundred miles long. This area suffered tragically from the German invasion. Most of the coal is of good quality and suitable for coking, while in the east of the coalfield are deposits of anthracite. The Donbas now produces over 180 million tons a year, more than one-third the Soviet total.

Large modern blast furnaces and foundries have been constructed, as at Makyeevka (350,000) and the adjacent Stalino (700,000). Most of the iron ore is obtained from Krivoi Rog to the west of the River Dnieper, and from the Kerch peninsula. There are a large number of metallurgical works and machine-building factories, *e.g.* at Lugansk and Kramatorsk. To the east of the coalfield at Volgagrad (590,000), on the bend of the Volga, are the now world-famous agricultural tractor works.

(2) THE DNIEPER COMBINE.—The second industrial centre is the greater Dnieper combine, around Dniepropetrovsk (660,000) and Dnieproges, both on the River Dnieper. This

Fig. 108. THE UKRAINIAN INDUSTRIAL REGION.—Numbers refer to areas described in the text.

region lies midway between the coal of the Donetz and the iron ore of Krivoi Rog (385,000). South of Dniepropetrovsk the river is impeded by rapids and there is a fall of over 100 feet in 40 miles. The Dnieper dam is over half a mile long and 180 feet high (cf. Niagara Falls). The electrical energy developed at Dnieprostroi is used for the production of coke, steel, aluminium and chemicals. A cable carries electricity to the industrial centres of the Donetz coalfield upwards of 150 miles away. Zaporozhye (430,000), a new town of extremely rapid growth, is an engineering centre specialising in agricultural machinery, and has steel and aluminium works using hydro-electric power.

(3) KRIVOI ROG.—The third industrial region of South Russia is around Krivoi Rog. The iron ore district extends from Krivoi Rog south-westwards to Nikolaev at the mouth of the River Bug. There are large metal works at Krivoi Rog.

Odessa (670,000) to the east of the mouth of the River Bug is a great wheat-exporting centre and manufactures agricultural machinery and clothing.

(4) SEA OF AZOV SHORES.—The fourth industrial region of South Russia is to be found along the shores of the Sea of Azov. The chief centres are Rostov (600,000), Zhdanov (Mariupol) and Taganrog. Iron ore is brought by steamers from the Kerch peninsula in the Eastern Crimea and coal carried back as return cargo.

In addition to the four metal-working centres described above there are a number of other industries in the large towns. These include flour milling, the extraction of sunflower seed oil and the refining of sugar, industries which are the direct outcome of agriculture. Nearly 70 per cent. of the sugar production is in Southern Russia, around Kiev (1,100,000), though the growing of sugar-beet and the refining of sugar is moving eastwards. There are also tanneries, boot and shoe factories and tobacco factories. *Kharkov* (930,000), formerly a large market town, is now the centre for a number of agricultural industries, making agricultural machinery, tractors and textiles, and has a large electro-chemical works.

Odessa, Berdiansk, Zhdanov, Taganrog and Rostov (600,000) are the exporting centres for the surplus agricultural produce, principally wheat.

The Urals (Fig. 109)

The Urals are rich in minerals, such as iron, copper, nickel, lead, zinc, petroleum and platinum. Russia is once more the leading world producer of platinum. In pre-Revolution days the methods of extraction of the ores and of smelting were extremely primitive. The known coal deposits were poor in quality and unsuitable for coking. Hence there were formerly few metallurgical centres in the Ural region and most of the ores raised were sent to the Moscow region. Now, the economic development of the Ural region has completely changed. Coal is mined around Sverdlovsk and Chelyabinsk (688,000), but the total output of coal from these fields is

small in relation to the requirements of the metal-working centres, and vast quantities of good coking coal are brought nearly 1,400 miles from Kuznetsk and Karaganda in Asia. In return, mineral ores are sent to Kuznetsk for the metallurgical industries on that coalfield.

There is a rich oil-yielding zone along the western side of the Urals (the Ural-Volga oilfields). Oil is already being obtained over a very wide area extending from such places as Ukhta, Perm (Molotov), Sterlitamak and Orenburg, near the Urals to Kuibyshev, Saratov and Volgagrad on the Volga.

The industrial development of the Northern Urals is retarded by difficulty of communication, and so the distribution of the metal industries is located in the centre and south between Tagil and Orsk. The chief centres are Sverdlovsk (800,000), Magnitogorsk (310,000) and Tagil (340,000). The most spectacular features of the Urals is Magnitogorsk, which did not exist in 1918. Huge blast furnaces are already working, using the rich ores of Magnet mountain and coal from Kuznetsk. Four more furnaces are in process of construction and when complete the production of pig-iron and steel from Magnitogorsk alone will be nearly half the total output of the British Isles (see plate facing page 225).

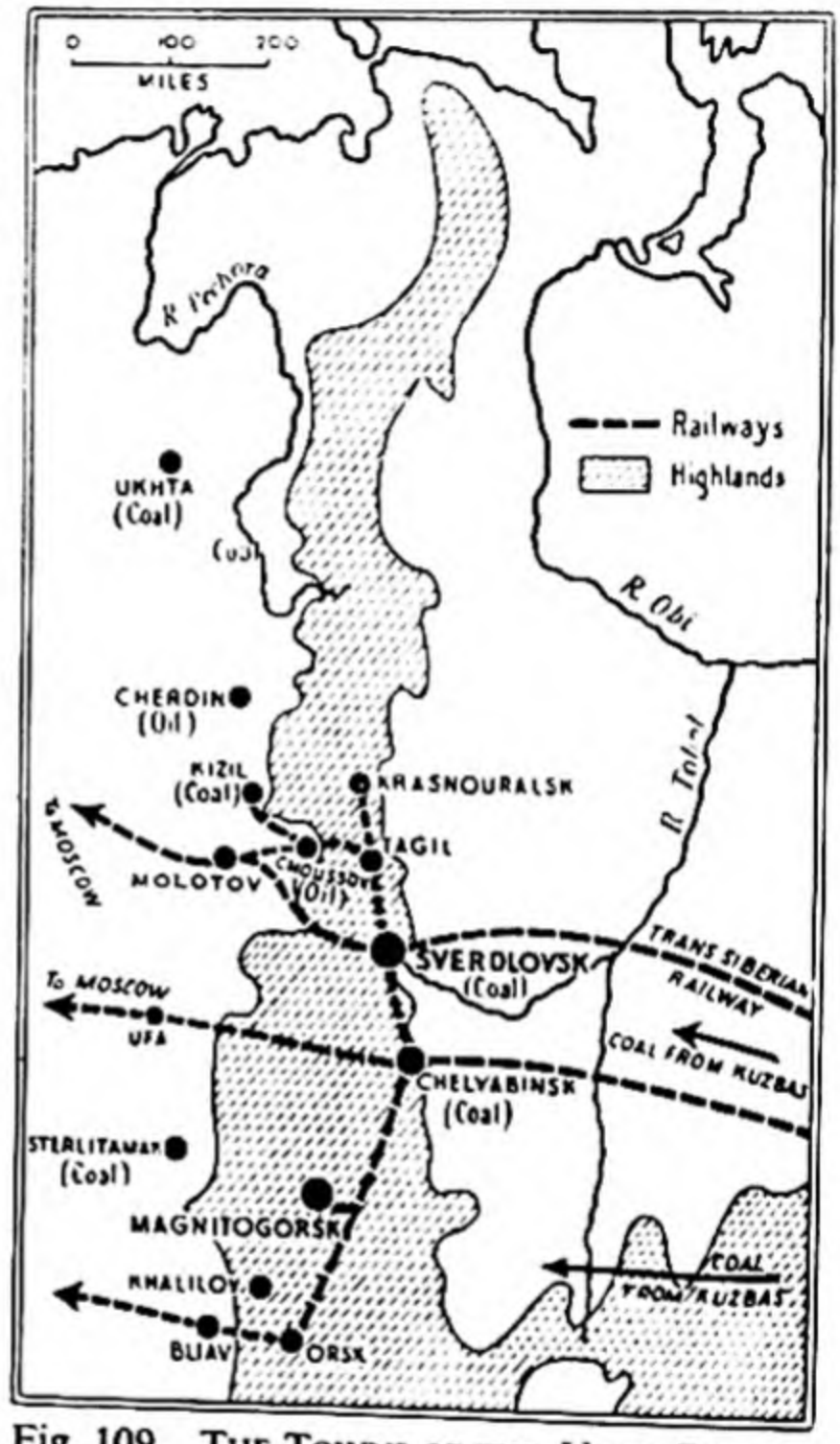


Fig. 109. THE TOWNS OF THE URAL REGION. —The chief manufacturing towns lie south of Tagil.

Iron is also smelted at Tagil, Sverdlovsk, Chelyabinsk and Khalilov; copper at Krasno-Uralsk and Bliav; and chromium, nickel and copper at Orsk.

Iron manufacturing is proceeding apace. Railway wagons are made at Tagil, trucks and tractors at Chelyabinsk, electrical equipment at Sverdlovsk and diesel engines at Orsk. There are engineering, paper, and chemical industries at Perm (628,000).

The Leningrad Region

This region lacks both coal and raw materials. Industries developed there during the period when Leningrad was the capital. There is a small textile industry and, because Leningrad is a port, shipbuilding is important, especially the construction of ice-breakers. There is some engineering, the manufacture of electrical equipment, and of railway stock.

Two great hydro-electric stations have been built near Leningrad on the River Volkhov and the River Svir. Cheap and abundant electricity has led to the development of a number of new industries, viz. paper, cellulose and aluminium.

Leningrad (3,300,000) was built by Peter the Great, at the mouth of the River Neva, in a district which was almost uninhabited marshland. This was during the period of the westwards expansion of Russia, and St. Petersburg, as it was then named, was the natural outlet of Russia to Western Europe. During its period as capital (1703-1927) it became a great port, through which Russia received manufactured goods from Western Europe, and exported large quantities of timber, and food products. The position of Leningrad was essentially marginal in relation to the Russian Empire, and this marginal position was emphasised when Russia lost so much of her Baltic territory after the War of 1914-18. Moreover, the Russians had always regarded Moscow as their national centre, and so in 1927 Leningrad was superseded by Moscow. The three million inhabitants were virtually isolated during the great siege, 1941-42, and endured untold privations, while the city suffered severely from repeated bombardments. Leningrad manufactures textiles, clothing, chemicals and specialised machinery, and does three-quarters of the Soviet shipbuilding. Lumber is exported.

The Kola Peninsula

A railway runs from Leningrad through Kandalashka (on the western arm of the White Sea) to the ice-free harbour of Murmansk (226,000). In recent years there has been active industrial development in the neighbourhood of the railway north of Kandalashka. In this region are aluminium works, chemical works, fish-canning factories and wood-working centres. The district appears to be rich in mineral ores awaiting development, the chief being iron, copper, nickel,

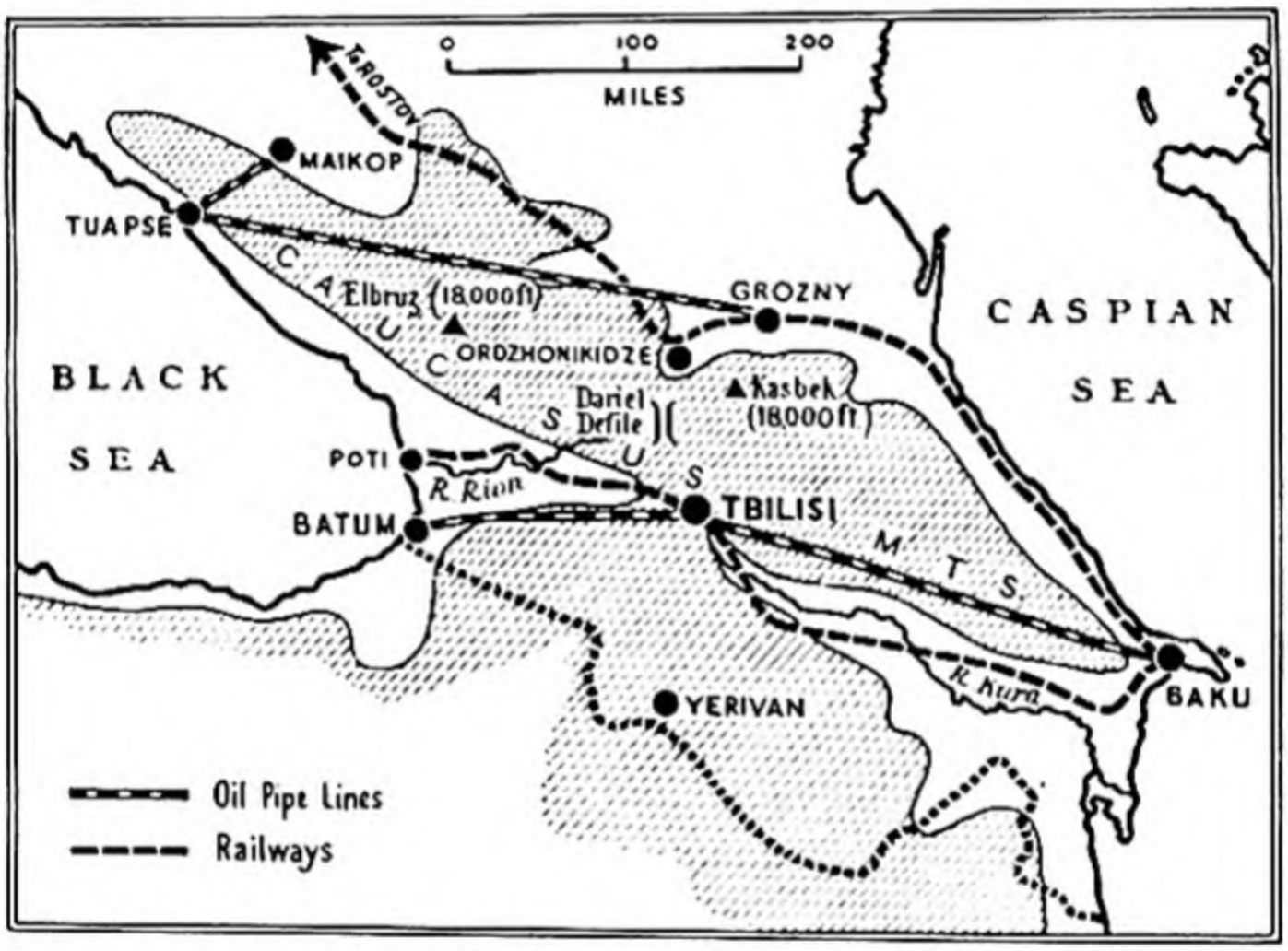


Fig. 110. THE CAUCASIAN REGION.

bauxite (for aluminium) and mica. Nearly 2 million tons of phosphate are mined annually for fertilisers.

Transcaucasia (Fig. 110)

South of the Caucasus Mountains is a great east to west depression drained to the east by the River Kura, and to the west by the River Rion. This region comprises the Georgian, Azerbaijan and Russian Armenian Soviet Republics. It differs climatically from the rest of Russia in that it has warmer winters and a large percentage of winter rain. All types of Mediterranean fruits are grown as well as wheat,

sugar-beet, tobacco, silk and cotton. Tea is grown on the hill-slopes, and though the yield is insufficient for Russian needs, Russia ranks as one of the greatest producers of tea outside south-east Asia.

Baku, Batum, Tbilisi and Yerivan are the chief towns.

There are exceptionally rich manganese deposits near Chiatury and ore is exported through the Black Sea port of Poti.

Baku (968,000), on the Caspian Sea, is one of the most important oil-yielding centres in the world. The oil is carried by pipe-line westwards to Batum on the Black Sea where it is exported, and also to the Ukraine, but most of the oil is shipped by tanker from Baku to the Volga.

Tbilisi (695,000), in the upper Kura valley, commands routes eastwards down the Kura valley to the Caspian, westwards down the Rion valley to the Black Sea, northwards via the great military road through the Dariel Defile across the Caucasus Mountains, and south-westwards to Erzerum and Asia Minor. It is engaged in the manufacture of cotton, woollen and silk goods, clothing, and in fruit canning and the manufacture of margarine. It has film studios and manufactures musical instruments.

Yerivan (509,000), in Armenia, is also engaged in the canning of fruit, and has tobacco works, clothing factories and film studios.

Central Asia

In Asiatic Russia the development of manufacturing industries on a large scale is taking place in:—

(1) Kuzbas.
(2) Tadzhik and Uzbek, around Samarkand and Tashkent.
(3) Around Irkutsk.
(4) In the Far East.

These regions are described fully in the volume on Asia.

The Forest Industries

The great coniferous forest belt of Russia, extending from the borders of Finland to the Pacific Ocean, contains one-third of the total forest land of the world. There are vast resources of pine, fir, larch and spruce of various types which could

be used for timber, paper making, and the manufacture of cellulose. So far, these resources have not been fully investigated. The western section (*i.e.* in European Russia), near to the greatest centres of population, has been far more extensively exploited than the forests of Siberia. The timber of these forests is used in the paper and cellulose works of the Leningrad and Moscow regions. The output of timber has increased greatly in European Russia, but more so in Eastern Siberia and still more in Western Siberia. A number of large timber combines (*i.e.* factories, including saw mills, paper and cellulose works, etc.) have been constructed, *e.g.* at:—

(1) Kondopozh in Karelia (to the east of Finland),

(2) Kama in the northern Urals,

(3) Krasnoyarsk in eastern Siberia, and

(4) Igarka, the new Arctic port at the mouth of the River Yenesei, which acts as a summer outlet for the Siberian forests.

Transport

Russia covers so vast an area that its population, almost half of which is urban, is necessarily widely scattered. Hence transport is a vital problem in any Soviet schemes for economic development. How serious the problem is will be realised from the fact that the *average* haul of coal and coke (which form a quarter of the freight carried on Russian railways) is 450 miles, and the *average* haul of such other large-scale commodities as timber, oil, iron and steel, and cereals, is between 600 and 900 miles. It is easy to see therefore why Russia is trying to make widely scattered areas as self-supporting as possible.

In 1958 a little over four-fifths of Russia's freight went by rail and about one-twentieth each by sea, by river, and by road. Total traffic is increasing for all forms of transport but more rapidly by road and sea.

RAILWAYS.—In 1913 the Russian railway system consisted of networks in Europe converging on Moscow and Leningrad and lines running to Baltic ports such as Riga and Reval, and Black Sea ports like Odessa. These latter lines were an essential part of the old economy of exporting grain, flax,

timber, etc., and of importing coal and manufactured articles. Only European Russia had anything of a network of lines, with 11·3 miles of railway per 1,000 square miles compared with the 0·6 mile of railway per 1,000 square miles in Asiatic Russia. The Asiatic lines consisted of little more than the Trans-Siberian and Trans-Caspian trunk lines. Even in Europe there were only three lines in the forested zone north of Leningrad:—

(*a*) Leningrad to Murmansk.

(*b*) Vologda to Archangel.

(*c*) Kirov to Kotlas on the Dwina.

The Soviet system has now about 75,000 miles of railway routes, more than half of which has been built since 1917 Soviet economy was for many years so little concerned with sea-borne trade that the importance of railways serving ports diminished and the new lines have all been built to assist internal trade and industry. In Europe there has been mainly a "thickening-up" of the existing network and the provision of some main through-lines. New lines include:—

(i) a direct Moscow-Donbas trunk line;

(ii) a complete circular by-pass for Moscow;

(iii) the North Pechora line, which runs from Kotlas on the Dwina, via Ukhta and Pechora, to Vorkuta, well inside the Arctic Circle, and has opened up the coal-field of the Pechora basin and the oilfields at Ukhta;

(iv) an extensive network in the Urals to handle the heavy traffic of this new industrial area. These routes link up at Sverdlovsk and Chelyabinsk with main lines from Moscow and Leningrad, which further east unite to form the Trans-Siberian railway.

It is in Asiatic Russia that there has been the most striking railway construction, new lines being built to enable new industrial areas to be developed. Thus the Turkmenian-Siberian Railway (Turk-Sib) rendered possible the indus-trialisation of Kazakstan and a more recent line running north from the Turk-Sib west of Lake Balkhash to the Tran-Sib at Petropavlovsk, west of Omsk, has enabled the Karaganda coalfield to be exploited. Many of these Asiatic lines have diesel traction.

There is at present in progress the building of a second Trans-Siberian railway running more or less parallel to the original, but on a more southerly route from north-west of Irkutsk (310,000) to Kuibyshev (Samara, 760,000). There is now a through route from Moscow to Pekin via Ulan Bator and Manchuria.

About 5 per cent. of the Russian railway system has been electrified, particularly in the Moscow and Leningrad areas, in the Urals and the Kuzbas.

RIVERS.—The rivers of Russia because of their size and gentle gradients are suitable for the extensive development of inland water transport, though ice-breakers are necessary in the winter. In the European U.S.S.R. the close approach of certain rivers, and the low watersheds between them, have enabled them to be joined by canals, thus giving connections between the Baltic, White, Black and Caspian seas. The Baltic-White Sea canals run from Leningrad via Lakes Ladoga and Onega, and Leningrad is also joined via the Neva and the Mariinsk to the upper Volga and thence to the Caspian, or via the Volga-Don canal, which runs westwards for 65 miles from the Volga at Volgagrad, to the Black Sea. These canals are ship canals, large enough to take small sea-going vessels of up to 2,000 tons. Moscow is joined to this system by the Moscow canal running northwards 80 miles to the upper Volga.

Freight particularly suited to river carriage includes timber, coal and building materials, oil, cement, and other minerals. About half the total river traffic is on the Volga, with timber going downstream and Donbas coal and Baku oil upstream. Oil from the Volga-Ural field is increasingly being carried.

In Asiatic Russia railways provide most of the east-west transportation and rivers the north-south. Hence large cities have developed where, *e.g.* the Trans-Siberian railway crosses rivers such as the Obi (Tomsk, 250,000) and Irtisk (Novosibersk, 887,000).

ROADS.—The Russian road system is poor by Western standards. Few of her roads have a hard surface and her length of asphalt or cement-surfaced road is less than one-fifth that of the United Kingdom. However, much work is

being done to improve the main arterial roads and considerable road construction has been undertaken in connection with the development of Central Siberia.

AIRCRAFT.—There has been an amazing development of air transport since 1928 and Russia is now one of the leading countries in the development of aircraft. There are regular air services between Moscow and Leningrad, the Ukraine, Transcaucasia, central Asia and the Far East.

There are also regular air services through the forested zones, both of European and Asiatic Russia, where road and rail communication is as yet poor or non-existent. Most of the large Russian cities are linked by regular air services.

The Future of Russia

From the foregoing description it will be clear that great changes have been wrought in Russia since 1928. The economic geography has been virtually re-made, and changes have been effected which, in our own country, have taken over 150 years to accomplish. What these changes augur for the future of Russia and what may be their ultimate effect on the rest of the world, is a matter to which thoughtful people throughout the world are giving serious consideration.

Up to 1914 agriculture in Russia was primitive, industries in the remote areas were mostly of the domestic type and mineral resources were poorly developed. In spite of immense and varied natural resources Russia imported large quantities of both coal and raw materials and nearly all the manufactured goods and machinery her people required. In fact, she was one of the most valued markets for the manufactures of the industrial regions of Western Europe.

Now the picture has changed radically. Russia to-day, producing her own machinery, textiles, chemicals, etc., is practically self-sufficing. Her imports of manufactured articles are limited to particular types of machinery and other specialised items. However, it is only comparatively recently that the Russian people have begun to experience an improved standard of living. More consumer goods are now becoming available but it will still be many years before housing, vehicles, domestic appliances and the like become adequate by Western standards.

After the war of 1939-45 the Communist system of government spread to a number of eastern and southern European countries—Poland, Czechoslovakia, the Russian-occupied Eastern Zone of Germany, Roumania, Bulgaria, Yugoslavia and Hungary. Yugoslavia, although still Communist, has since broken relations with the Soviet Union and is more closely aligned with the West. The remaining countries form the so-called Soviet bloc of satellites and their economic life is being closely linked with that of Russia herself. Farther

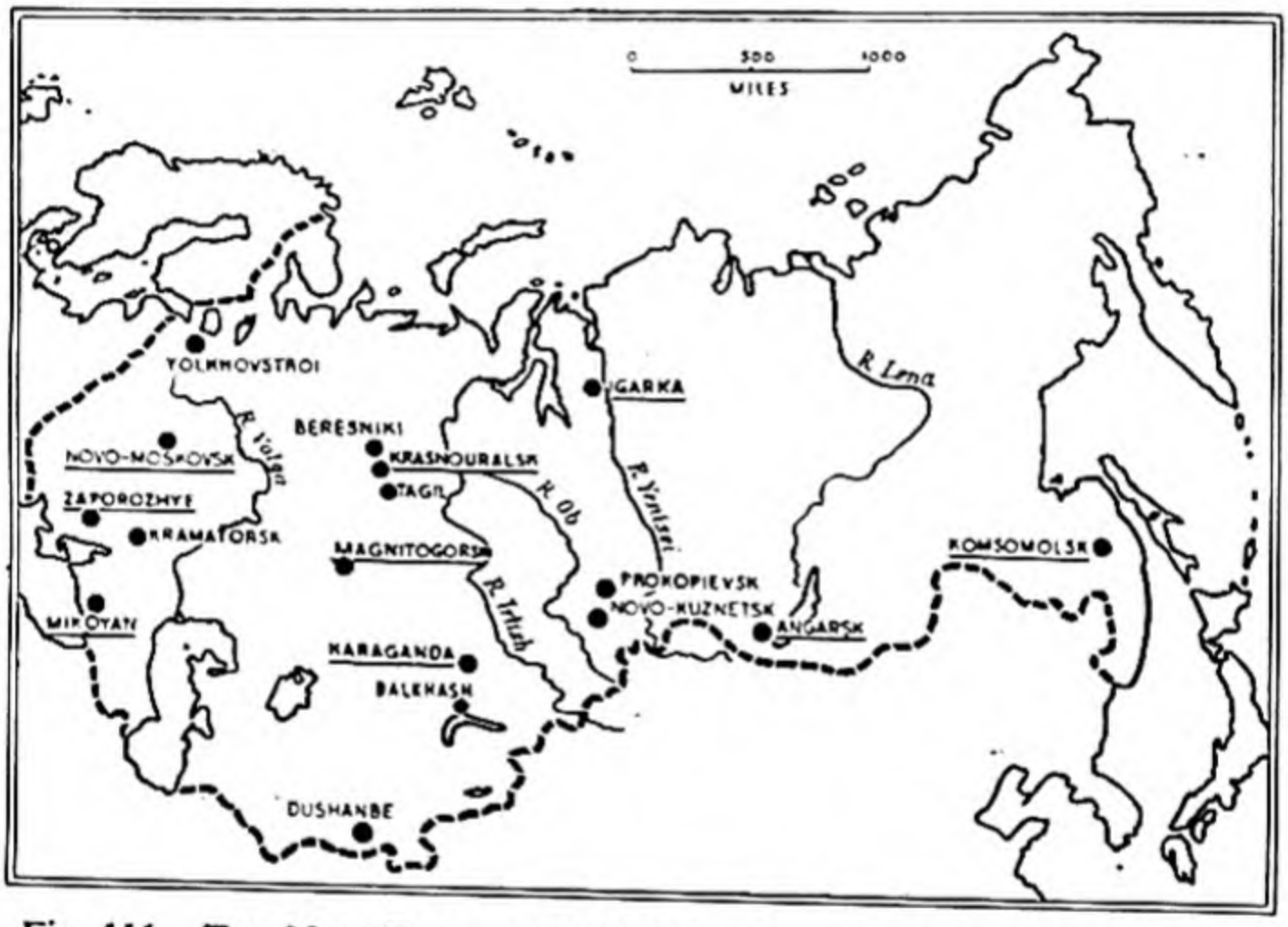


Fig. 111. THE NEW TOWNS OF U.S.S.R.—New towns underlined. The other towns marked have experienced mushroom growth from small villages.

East, China, with a population of 500 millions, is also Communist, seeking to develop her economic strength in the same way as Russia has done, and at an even greater pace.

Some of the New Cities and Towns of Russia

Russia now has three towns with a population of over a million, 25 with over half a million and 132 between 100,000 and 500,000. The development of new industrial districts and agricultural areas has led to the creation of many new towns and the development of large towns where

only small villages existed. Some of the chief of these are enumerated below, and shown on Fig. 111, and their population is given as recorded in the 1959 Census.

In all, nearly a hundred new towns have been created and 2,000,000 people live in them. With the rapid growth of industry which now employs over half the total working population, there has naturally been a large-scale movement of population into the towns and most of the older towns, except one or two of the very largest, have increased in size three-fold or even more during the last thirty years.

It should be emphasised that in general Russian urban centres are much more widely separated than those of Western European countries and the density of population of the intervening areas is also much smaller than in the West.

Trade

Compared to her internal trade, the external trade of the U.S.S.R. is relatively small although it has increased greatly in recent years and is still increasing. It amounts to about two-fifths that of the United Kingdom. The greater part of this trade is with other countries of the Soviet bloc, to which the U.S.S.R. stands somewhat in the position of a mother-country to her colonies.

In 1958 more than half Russia's trade was with the communist countries of Eastern Europe and nearly a quarter was with Asia (mainly China). Trade with Western Europe amounted to about £500 million. The United Kingdom, Finland and France were Russia's chief customers in Western Europe, and Finland and France her principal suppliers.

Russia's chief exports are mineral ores (iron ore) 11 million tons, potash 250,000 tons, fuels (petroleum 25 million tons, coal 9 million tons), grain (7 million tons) and industrial equipment. Her chief imports are oil seeds, iron and steel, ships and locomotives, chemicals and specialised industrial equipment.

Russian exports to the United Kingdom in 1959 were worth £63 million of which timber and wood pulp accounted for over one-third. Other items included furs, tin, aluminium and flax. Russian purchases from us amounted to about £25 million, and machinery was much the largest single item. Copper wire, chemicals and textile fibres were among the other principal items.

SOME NEW TOWNS OF EUROPEAN RUSSIA

TOWN	POP.	DISTRICT	OCCUPATIONS
Zaporozhye ..	435,000	Ukraine	Metallurgy
Tagil	338,000	N. Urals.. ..	Metallurgy and Wagon Works
Magnitogorsk ..	300,000	S. Urals	Iron Works
Kramatorsk ..	115,000	Ukraine	Metallurgy
Novo-Moskovsk (Stalinogorsk)	107,000	Moscow region	Chemicals
Beresniki	106,000	N. Urals.. ..	Chemicals
Elektrostal ..	97,000	Moscow region	Engineering
Krasnouralsk ..	62,000	Central Urals ..	Copper

SOME NEW TOWNS OF ASIATIC RUSSIA

TOWN	POP.	DISTRICT	OCCUPATIONS
Karaganda ..	398,000	Kazakstan ..	Coal Mining
Novo-Kuznetsk (Stalinsk)	377,000	Kuzbas	Metallurgy
Prokopeivsk ..	282,000	Kuzbas	Coal Mining
Kemerovo ..	277,000	Kuzbas	Chemicals and Coal
Dyushambe (Stalinabad)	224,000	Tadjik	Development of Tropical Agriculture and Cotton
Frunze	217,000	Kirghizia ..	New Capital
Komsomolsk ..	177,000	Lower Amur ..	River Port and Shipbuilding
Angarsk	130,000	Angara River ..	Oil-refining and Chemicals
Anzhero-Sudzhensk	116,000	Kuzbas	Mining
Balkhash	53,000	Kazakstan ..	Copper Refining
Igarka	[10,000]	Mouth of Yenesei	Arctic Port, Saw Mills

Europe: Population, Production, and External Trade, 1960

Country	Population (Millions)	Density per square mile	Cattle (Millions)	Sheep (Millions)	Wheat (M. tons)	Oats (M. tons)	Rye (M. tons)	Maize	Potatoes (M. tons)	Sugar (M. tons)	Wool ('000 tons)	Coal (M. tons)	Lignite (M. tons)	Petroleum (M. tons)	Natural Gas ('000 M. cu. ft)	Iron Ore (M. tons iron)	Steel (M. tons)	External Trade (£M.)
Austria . .	7·1	209	2·3	0·2	0·7	0·3	0·4	0·2	3·6	0·3	—	—	6	2·4	51	1·0	3·1	885
Belgium	9·1[2]	774	2·7	0·1	0·6	0·5	0·2	—	1·5	0·5	—	23	—	—	—	—	6·4	2760
Bulgaria	7·7	179	1·3	8·8	2·4[2]	0·2[2]	0·1[2]	1·5	--	0·2	19	—	15	0·2	—	—	0·3	375[2]
Czechoslovakia	13·6	272	4·3	0·7	1·6[2]	0·9[2]	1·0[2]	—	6·3[2]	1·1	—	28	58	0·1	—	1·0	6·7	1337
Denmark	4·6	277	3·4	—	0·3	0·7	0·4	—	2·0	0·3	—	—	—	—	—	—	0·3	1170
Finland	4·4[3]	34	1·9	0·3	0·4	1·1	0·2	—	1·8	0·1	—	—	—	—	—	—	0·3	596[2]
France . .	45·5	214	18·9	8·9	10·9	2·8	0·4	2·6	15·1	2·7	18	56	—	2·0	156	22·5	15·2	4760
Germany (E.)	16·2[2]	392[3]	4·5	2·1	—	1·0[2]	2·1[2]	—	24·5[2]	0·9	6	3	226	—	16	0·4[1]	3·3	1441[2]
Germany (W.)	52·4	549	12·5	1·1	4·9	3·3	4·0	—	24·5	2·0	3	142	96	5·5	—	4·4	34·1	7780
Greece . .	8·3	162	1·0	9·3[2]	1·7	0·1	—	0·3	0·4	—	2	—	—	—	—	0·2[1]	—	325
Holland	11·5	833	3·5	0·5	0·6	0·4	0·5	—	3·1	0·7	1	13	—	1·9	—	—	1·7	3100
Hungary	10·0	278	2·0	2·4	1·9[2]	0·3	0·4	3·5	2·4[2]	0·5	3	3	24	1·2	12	—	1·9	652
Italy . .	49·4	380	9·4	8·3	6·8	0·4	0·1	3·8	3·9	1·0	10	1	1	2·0	226	0·6	6·8	3080
Norway	3·6	26	1·1	1·8	—	0·2	—	—	1·1[2]	—	5	—	—	—	—	1·2	0·5	842
Poland . .	29·7	247	8·7	3·7	2·5[2]	2·5[2]	8·1[2]	—	35·7[2]	1·5	9	104	9	0·2	20	0·8	6·6	1007
Portugal	9·1	264	—	—	0·4	—	0·1	0·5	0·9	—	8	—	—	—	—	—	—	313
Roumania	18·4	201	4·4	10·6[2]	4·0[2]	0·3[2]	0·1	5·5	2·9	0·4	21	8	—	11·5	202[1]	—	1·8	487
Spain . .	30·1	147	—	—	3·7	0·5	0·5	1·0	4·6[2]	0·5	26	14	2	—	—	2·7	1·9	523
Sweden . .	7·5	43	2·5	0·2	0·9	1·0	0·2	—	1·8	0·4	—	—	—	—	—	12·8	3·2	1980
Switzerland	5·4	326	—	0·2	0·3	—	—	—	1·5[2]	0·2	—	—	—	—	—	—	—	1480
United Kingdom	52·7	571	11·8	28·0	3·1	2·1	—	—	7·3	0·9	61	197	—	0·1	—	5·2	20·5	8310
U.S.S.R.	214·4	25	97·0	136·1	63·7	13·6	16·1	18·5	84·0	7·0	360	370	142	147·0	1640	64·1	65·3	3997
Yugoslavia	18·7	190	5·3	11·5	3·6	0·4	0·2	6·2	3·0	0·3	15	1	22	0·9	2	1·1	1·4	501

[1] = 1961. [2] = 1959. [3] = 1958. — = nil or negligible.

QUESTIONS

1. What do you understand by the Baltic Shield, the Hercynian System, and the Armorican System? Describe the main features of each.

2. Describe the various types of lowland which occur in Europe.

3. Which areas of Europe may be said to have benefited from the Ice Age, and which have not? Give reasons for your answer.

4. By reference to European lakes, indicate the various ways in which lakes may be formed.

5. Describe the coastal features of Europe along the west coast from Hammerfest to Lisbon.

6. Explain: (*a*) Why Berlin has a higher average summer temperature than Valentia.

(*b*) Why the shores of Iceland have temperatures in January similar to those of the northern shores of the Black Sea.

(*c*) Why Central Europe has most rain in summer.

7. To what extent is it true to say that " the three southern peninsulas of Europe have warm winters and most rain in winter "? Account for any variations you have noted.

8. Describe the main changes in natural vegetation which may be observed during journeys—

(*a*) from Havre to Moscow;

(*b*) from Archangel to the Crimea.

9. On a sketch-map of Europe show the chief areas producing wheat, marking distinctively those which have a surplus for export.

10. What are the climatic conditions which determine the areas in which large-scale production of vines, flax, and olives may occur? Illustrate by reference to the chief producing areas in Europe.

11. Give instances in Europe of the development of new coalfields in the twentieth century and state carefully the present and potential effects of such developments.

12. On an outline map of Europe, mark the political boundaries and insert the chief mining centres, excluding coal and iron regions. Add a key to your map.

13. " European supplies of gold, silver, tin, and nickel are insignificant." From what parts of the world does Europe obtain these minerals?

14. " The greatest industrial advances have occurred in those European countries possessing large supplies of coal and iron." To what extent is this statement true?

15. Show by sketch-maps or diagrams the control exercised by physical features on the routes followed by any two of the railway routes given in Fig. 22.

16. Compare the distribution of population in—

(*a*) Italy and the Balkan Countries;

(*b*) Belgium and Portugal.

Account for any marked differences.

17. State concisely the racial problems affecting Yugoslavia, Roumania and Poland respectively.

18. Compare and contrast the economic development of Aquitaine and the Paris Basin.

19. On a map of France mark one important area for each of the following:—

(*a*) flax, apples, olives, wheat;

(*b*) iron ore, bauxite (aluminium), kaolin, petroleum;

(*c*) the chief fishing centres and naval ports;

(*d*) one important town concerned with the manufacture of each of the following: silk, cotton, linen, pottery, gloves.

20. (*a*) Draw a map of France indicating the main rivers, then mark and name clearly the principal canals connecting them.

(*b*) Why is it that the volume of canal traffic is much greater in France than in Britain?

21. Construct a map showing the principal air routes between England and the Continent, and calculate the approximate distance along each route.

22. Describe the position of the ports of Marseilles, Havre, and Bordeaux. Discuss the relative importance of these ports to France.

23. Why is it that most of the French farms are extremely small? What are the advantages and disadvantages of such a system?

24. Make a list of the chief imports into France, adding if possible the value of each in a recent year. To what extent can these imports be obtained from her colonies?

25. Compare the farming and industrial activities of Holland and Belgium.

26. Describe the methods adopted by the Dutch to improve (*a*) Polder land, (*b*) Geestland.

27. Which is better situated for dealing with the trade of Holland—Amsterdam or Rotterdam?

28. How does the trade of Holland and Belgium benefit by their colonial possessions?

29. (*a*) Divide an outline map of Belgium into natural regions and indicate the distribution of crops within them.

(*b*) On a second map mark the chief industrial centres and name the industries connected with each.

30. Give reasons for the division of the Netherlands into two political regions.

31. Compare the physical and climatic conditions of Denmark and the Central Plain of Ireland. Which appears to be better placed for the development of dairy farming?

32. Account for the importance of Copenhagen.

33. Compare the positions of Gibraltar, Copenhagen, and Istanbul.

34. How has the construction of the Kiel Canal affected Denmark?

35. Draw comparisons between Norway and Sweden with regard to (*a*) Physical features, (*b*) Climate, (*c*) Occupations.

36. Describe the characteristic features of a Norwegian fiord.

37. Explain clearly why the possession of a large share of the carrying trade of the world is of great importance to the people of Norway.

38. Describe the position of Oslo and Stockholm, and discuss the suitability of these towns to be the capitals of their respective countries.

39. Show how the economic life of Finland is related to its geographical environment.

40. Give an account of the mineral and agricultural resources of Poland.

41. Draw sketch-maps to illustrate the importance of the position of (*a*) Gdansk (Danzig), (*b*) Warsaw, (*c*) Stalin (Vilna).

42. Explain how the canal system of Germany tends to focus the trade of the country upon the port of Hamburg. Illustrate your answer by a sketch-map.

43. Give an account of the cargoes which a vessel plying between England and the Baltic would probably carry in each direction.

44. Show how the lives and occupations of the inhabitants of either Finland or Switzerland are influenced by geographical conditions.

45. Select two markedly different regions of Europe which are sparsely inhabited. Describe the lives of the inhabitants and account for the lack of development within the areas.

46. Draw a sketch-map of the Rhine Basin. Indicate clearly the Rift Valley, the canals linking the Rhine or its tributaries with other river systems; the chief river ports and mining centres.

47. Show on a sketch-map the outlets for the Ruhr coalfield and sources of supply of imported raw materials.

48. What is the importance of the potash industry to Germany? In what other region of Europe do valuable potash deposits occur?

49. Point out similarities and differences in the occupations of the people of Denmark and Holland.

50. Describe and account for the distribution of textile industries in Germany.

51. Describe the methods which have been employed in various parts of Germany to improve the fertility of the soil.

52. Compare the Rhone and the Rhine as highways of trade.

53. Explain why the town of Vienna was adversely affected by the creation of a number of independent states in Central Europe.

54. What geographical factors help to account for the development of manufactures in Switzerland? Which are the chief manufacturing centres?

55. Show clearly on a sketch-map the principal routes across the Alps. Mark the chief towns controlling the passes.

56. Compare and contrast Switzerland and Finland.

57. Describe the sites of the towns of Berne, Interlaken and Basel.

58. Point out the main differences in physical features and economic development of Bohemia, Moravia and Slovakia.

59. Discuss the relative advantages of North Sea and Mediterranean ports for handling the trade of Bohemia.

60. Compare the economic resources of Hungary and Austria.

61. Draw a sketch-map, similar to Fig. 63, to show the position of Budapest.

62. Describe the course of the River Danube, naming the countries and referring to the physical characteristics of the different regions through which it flows.

63. Obtain temperature and rainfall statistics for the plains of Hungary and the Paris Basin. Draw graphs to show the climatic conditions prevailing and account for any marked differences indicated by the graphs.

64. "A river is generally a bad political boundary." By examining the rivers of Europe which form political boundaries discuss the truth of this assertion.

65. Compare the physical features of the opposite shores of the Adriatic Sea.

66. What are the characteristic features of the Karst type of scenery? Refer to three regions in Europe, one of them in Great Britain, in which such scenery occurs.

67. "The importance of the Balkan peninsula arises from the routes which cross it." Show on a sketch-map the principal Balkan routes and the physical features controlling them.

68. Some European countries have been provided with special facilities for trade at ports outside their own frontiers. Find as many examples as you can of such ports and briefly explain the circumstances which have made such arrangements necessary.

69. Write a brief description of the following regions:—Bessarabia, Dobruja and Transylvania.

70. Compare the eastern and western basins of the Mediterranean Sea.

71. Show on a map of the Mediterranean Sea the parts of the coastline and the islands controlled by Britain and Italy respectively. Account for the growth of British interests in this part of the world.

72. Describe the physical features of Greece.

73. With the aid of sketch-maps account for the importance of the sites of (*a*) Belgrade, (*b*) Salonika, (*c*) Athens, (*d*) the island of Corfu.

74. "Extensive deforestation leads to rapid soil erosion." What does this statement mean? Give examples from Europe in illustration.

75. Which regions in Europe depend upon irrigation? Give an account of the farming activities practised in these regions.

76. Under what conditions of soil, climate, etc., are tropical or sub-tropical products such as rice, cocoa, etc., cultivated in Europe?

77. Account for—

(*a*) The development of manufactures in the northern plain of Italy.

(*b*) The decline in importance of Venice as a port.

(*c*) The greater production of Northern Italy compared with Peninsular Italy.

78. In some countries of Europe the industries are based on agricultural products. Compare Germany, Holland and Italy in this respect.

79. Compare the development of the lands on the western and eastern slopes of the Apennines.

80. Describe the sites of the towns of (*a*) Milan, (*b*) Rome, (*c*) Genoa, (*d*) Trieste, and account for their development.

81. Write brief geographical descriptions of Iceland, Spitzbergen, Sardinia, Crete and Cyprus.

82. Describe the changes in physical, climatic and vegetation conditions likely to be experienced during a journey following a line drawn from Toulouse to Malaga.

83. On a map of the Iberian peninsula mark (*a*) fold mountains, (*b*) irrigated regions, (*c*) fishing ports, (*d*) centres of copper, coal, mercury and iron mining, (*e*) rail routes connecting (i) Corunna and Bilbao, (ii) Valencia and Cadiz, (iii) Barcelona and Madrid. Comment upon these routes.

84. Distinguish between the "Atlantic" and "Pacific" types of coastline. Give examples of each type along the coast of Europe.

85. Can the physical features of Iberia be regarded in these days as obstacles to the unification of the peninsula under one political control?

86. What results of the Moorish occupation of Spain are still evident in the country?

87. Comment upon the suitability of Madrid as the capital of Spain.

88. Show how modern inventions and the opening up of new lands have affected the trade of Spain.

89. Compare under the headings (*a*) physical features, (*b*) climate, (*c*) products, (*d*) occupations—

(i) Catalonia and Castile.

(ii) Galicia and Andalusia

90. Make a list of the colonial possessions of Portugal, and write a brief geographical account of *one* of them.

91. State exactly the regions included in the U.S.S.R.

92. In view of the vast area and resources of Russia, why has it become necessary to attempt to develop the Arctic regions? What progress has been made in these regions in recent years?

93. "Russia will eventually be better able to supply all her own requirements than either the U.S.A. or the British Commonwealth." Discuss this statement.

94. What climatic conditions give rise to steppe vegetation? State exactly the extent of this type of vegetation in Europe and describe the mode of life of the inhabitants of the steppe lands.

95. Show how the distribution of soils in Russia gives support to the view that climatic factors influence the formation of a certain type of soil.

96. Summarise the changes which have occurred in Russian agriculture in recent years.

97. What changes have occurred in the distribution of crops in Russia? Give examples.

98. Describe the agricultural and industrial activities of the inhabitants of the Russian Ukraine.

99. Write an account of recent developments in the Ural region and in the Donetz valley.

100. Draw a sketch-map to explain the growth of the towns of Moscow, Leningrad, Kiev and Tiflis.

101. Select three regions of Europe in which the use of hydro-electric power has led to important industrial developments. Describe the industries which have arisen in each case.

102. What are the principal types of mountains? Give examples in Europe and some explanation of the mode of formation of each type.

103. On an outline map of Europe insert the 70° F. July and 32° F. January isotherms. Note the regions into which the continent is divided and describe the main features of the climate of each.

104. Account for any peculiarities you may notice in the course taken across Europe by the 32° F. January isotherm.

105. Study the map showing distribution of population in Europe. Give a general description of the distribution in the three southern peninsulas, and account for the more striking differences.

EXAMINATION QUESTIONS

The following questions have been reproduced by permission of the various Examining Bodies concerned from examination papers at the Ordinary Level of the General Certificate of Education. Questions marked with an asterisk are from *Alternative* papers.

(*C.*) Cambridge, (*L.*) London, (*N.*) Northern Universities, (*O.*) Oxford, (*O. & C.*) Oxford and Cambridge Joint Board.

1.* Describe, with the aid of a sketch map, the geographical basis for the importance of any *one* important North Sea port in *each* of the following countries: England, France, Germany. (*O. & C.*)

2. Select *three* major seaports of Europe situated, *one* in the Atlantic, *one* in the Baltic and *one* in the Mediterranean. Describe the position and the character of the trade of each. Sketch maps are required. (*L.*)

3. Select coal, *or* iron ore, *or* mineral oil. Insert on a large sketch map the chief areas of its production on the *continent* of Europe. For each of the areas, state the major geographical consequences of the exploitation of the mineral. (*O.*)

4. Select *one* of the following pairs: (*a*) the Ruhr and Clydeside; (*b*) Portugal and Eire; (*c*) Switzerland and the Lake District. For the selected pair describe the geographical resemblances and differences as they affect the life and work of the people. (*O.*)

5. A tourist plans to voyage from Southampton and visit *six* coastal places of interest in Southern Europe. Describe a route he might follow, the places visited and their geographical importance. Illustrate your answer with a sketch map. (*O.*)

6. Write an account of the Alps under the following headings:—

(i) the character of their surface features;

(ii) the important rivers rising in them and their part in supplying the waters of these rivers;

(iii) their influence on transport routes;

(iv) industrial development in their area including the sources of the raw materials and power used. (*N.*)

7. Explain the importance of *three* of the following: fishing in Norway; wheat growing in Southern Italy; silk manufacture in the Lyons area of France; timber products in the French Landes; iron and steel production in the Ukraine. (*L.*)

8. Describe the chief natural resources of *one* of the following: Austria, Czechoslovakia, Finland, Yugoslavia, and indicate how the main occupations of the people are related to these resources. (*L.*)

9. Explain *three* ways in which geographical considerations influence the occupations of the people in *one* of the following: Brittany; Sicily; the Jutland peninsula. (*O.*)

10. Draw sketch maps to show *three* of the following: Gap of Carcassonne; Burgundy Gate; Moravian Gate; Iron Gate. Show the importance, as a means of communication, of *one* of the three you have chosen. (*O.*)

11.* Draw a sketch map of France to show a division of the country into natural regions, and state briefly how the types of farming and farm products of any *two* of the divisions marked on your map are affected by relief and climate. (*O. & C.*)

12. Draw a sketch map of the Rhône-Saône Valley to show the bordering highlands, the chief tributaries of the main river and *three* towns. Give an account of the farming in this valley. (*C.*)

13. Three of the great seaports of France are Bordeaux, Le Havre and Marseilles. Describe with the aid of sketch maps the position and trade of each of these ports. (*C.*)

14.* (*a*) Describe the physical features of each of two of the following areas, and (*b*) discuss their effect on the mode of life of the inhabitants: Central Plateau of France, Brittany, the French Alps. (*O. & C.*)

15.* Illustrating your answer with a sketch map, discuss the nature and distribution of agricultural and industrial activities of Belgium and the Netherlands. (*O. & C.*)

16. Give reasons which help to explain the high average density of population in the Netherlands and Belgium. (*C.*)

17.* Describe *either* (*a*) the agricultural geography of the Netherlands *or* (*b*) the industrial geography of Belgium. (*O. & C.*)

18. With respect to the population of Norway, explain:

(*a*) why the average density for the whole country is low;

(*b*) why the population is unevenly distributed;

(*c*) why there is a marked concentration of people in the Oslo area. (*C.*)

19.* Describe in some detail the factors, physical and economic, which have favoured the development of hydro-electric power in the Scandinavian peninsula. (*O. & C.*)

20. Norway is a country having a deeply indented coastline, fringed by many islands, and with many fiords. Much of the interior is mountainous with many swift streams. Forests cover one-fourth of the country and about one-fortieth of its area is cultivated.

Name the chief occupations of Norway and show how they are related to the geographical conditions given above. (*C.*)

21. Two important resources of Sweden which are developed for export are iron ore and forest products:

(*a*) Show by means of a sketch map the parts of Sweden in which both these commodities are produced, and mark the routes and chief ports used for the export of iron ore.

(*b*) State the geographical conditions which favour the production of the forest products. (*C.*)

22. Only about one-seventh of Sweden can be cultivated. (*a*) State clearly why this is so. (*b*) Give details of *four* occupations of the country other than agriculture. (*O.*)

23.* Describe, comparatively, *either* the iron and steel industries *or* the textile industries of the Ruhr and West Riding industrial areas with regard to (*a*) position, (*b*) transport facilities, (*c*) sources of raw materials, (*d*) access to markets. (*O. & C.*)

24. A zone of dense population exists in Germany between Dusseldorf and Dresden. (*a*) Draw a map to show the relief and other relevant features of the zone. (*b*) Explain why the zone is densely populated, giving details of the chief occupations. (*O.*)

25. Choose *three* towns in Germany, each of which is important for a different manufacturing industry. Describe, with the aid of sketch maps, the position of *each* of the three towns and account for the development of the stated industries. (*C.*)

26. Write an account of the textile industries of northern Italy, noting (*a*) the chief producing areas, and (*b*) the geographical conditions which have favoured the development of these industries in this region. (*O. & C.*)

27. (*a*) Draw a large sketch map of the Iberian peninsula. On your map mark and name:

(i) Cantabrian Mountains, Pyrenees, Sierra Nevada;
(ii) Any *two* rivers;
(iii) Barcelona, Lisbon, Oporto, Seville, Valencia;
(iv) *One* town associated with the production of each of the minerals copper, iron ore, mercury, naming the mineral concerned in each case.

(*b*) Describe *one* important activity carried on in each of *two* of the towns named in (iii). (*O. & C.*)

28. Describe the physical and human conditions which explain why the olive is widely cultivated in the countries which border the Mediterranean Sea. Illustrate your answer by reference to *one or more* important area of production. (*O. & C.*)

29. Wheat, wine and oil are the typical farming products of Mediterranean Europe. Show how geographical conditions favour the growth of these products in Mediterranean Europe, and name *one* region important for the production of each. (*O.*)

30.* Choose *either* (*a*) the Spanish Meseta and the Mediterranean coastlands of Spain *or* (*b*) the north Italian plain and peninsular Italy: describe how, and explain why, the areas chosen differ in (i) climate, and (ii) density of population. (*O. & C.*)

31. Describe the Russian Steppe in Europe under these headings: (*a*) relief; (*b*) climate; (*c*) occupations of the inhabitants. Draw a sketch map to illustrate your answer. (*O.*)

32. Draw a large sketch map to illustrate the geography of the Volga basin. Mark any important canal links with other rivers. (*L.*)

33.* Divide *either* Belgium *or* Sweden into geographical regions, indicating briefly the distinctive natural features of each region. and their effect upon the distribution of population and settlements. (*O. & C.*)

34.* Describe (*a*) the manufacturing industries of Switzerland, and (*b*) the dairying industry of Denmark, explaining in each case the geographical circumstances which encouraged these countries to specialise in the types of occupations mentioned. (*O. & C.*)

35. Draw a map of *either* Spain and Portugal *or* Italy to show the chief relief divisions. Briefly describe the divisions, and show how relief affects the occupations. (*O.*)

36. Describe the characteristic farming activities of the people of Denmark and of Brittany. Then state concisely how and why these activities differ. (*C.*)

37. Illustrating your answer with a sketch map divide *either* France *or* Germany into physical regions. Describe the main features of the relief of *two* of the regions of the country selected. (*L.*)

38. Choose *two* of the following: Western Norway, Northern Germany, the Netherlands, South-West France (south of the Gironde). For *each* of the two chosen:

(*a*) Describe the character of the coast and of the belt of adjoining mainland.

(*b*) Explain how the occupations of the people in this coastal belt are related to the characteristics described. (*C.*)

39. (*a*) Draw a sketch map of the River Danube and its basin. Name *three* of the mountain areas which help to define the basin, *three* important cities within the basin, and *two* of the tributaries of the Danube.

(*b*) Certain parts of the basin are important producers of timber, pigs, maize, wine, petroleum, wheat. Choose *three* of these commodities, show on your map *one* area of production for each of those chosen and describe the conditions under which it is produced. (*N.*)

40. With the aid of a sketch map give a geographical account of *either* the Elbe basin *or* the Danube basin below Vienna. (*L.*)

41.* Draw a sketch map to show a division into physical regions of the country through which the Rhine flows between Basle and the Dutch frontier and describe, with the help of diagrams, the physical characteristics of each of the regions shown on your map. (*O. & C.*)

42. Show how the position, physical features and climate of *either* Greece *or* the Mediterranean areas of France have affected the distribution and occupations of the inhabitants of the selected area. (*O. & C.*)

43. Describe one of the following:—

(*a*) The industrial geography of Spain.

(*b*) The geographical characteristics of the three main regions into which Switzerland may be divided.

(*c*) The mining, forestry and fishing industries of the Scandinavian peninsula. (*C.*)

44. Show with the aid of a sketch map how railway routes are related to relief in *one* of the following: (*a*) Switzerland, (*b*) Northern Italy, (*c*) the Balkan peninsula. (*L.*)

45. Scandinavia and Spain are scantily peopled. State the factors which contribute to this sparsity of population under the headings: (*a*) location; (*b*) climate; (*c*) resources; (*d*) trade. (*O.*)

46. Write an orderly account of *one* of the following: Austria, the Netherlands, Yugoslavia. (*L.*)

47.* Show how geographical factors have contributed to the importance of *three* of the following: Basle, Cologne, Geneva, Hamburg, Rouen, Marseilles. (*O. & C.*)

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